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*Ready at all times
for immediate use*

SIZE (outside dimensions):
Length 16", Breadth 11", Depth 6½".

PRICE: 8 GUINEAS NETT, CARRIAGE PAID BRITISH ISLES
(EXPORT PRICE: £9 POSTAGE PAID)

The arrangement of the contents is as follows:

- | | |
|--|--|
| LID. 2 Artery Forceps
1 Dissecting Forceps
1 pair Scissors
2 Stainless Knives in Sterilizable Glass Tube
1 Tube Silkworm Gut Medium | 1 Combined Electric Throat Lamp and Tongue Depressor
1 Hypodermic Syringe in Spirit-tight Case
1 Half Min. Magnifying Clinical |
|--|--|

REAR COMPARTMENT. Seven stoppered bottles in nickel screw-capped cases, each with contents engraved outside as follows:

- | | |
|---|--|
| CHLOROFORM
TR. IODI
SOL. ACID PICRIC 5%
TABS. HYDRARG. PERCHLOR. | LYSOL
METH. SPIRIT
SUTURE AND HYPODERMIC
NEEDLES IN ALCOHOL |
|---|--|

In front lies a thick glass tube with rubber cork, containing No. 8 Gum Elastic Catheter and a tube of Lubricant.

CENTRAL COMPARTMENT. On one side a prescription note-book with pencil and on the other a nickel-plated case with clips for tubes of hypodermic tablets.

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FRONT COMPARTMENT. For sundries and dressings, with lid to keep the contents in place.

- | | |
|--|--|
| 2 oz. Compressed Boric Lint
2 oz. " Plain
6 yds. " Gauze
4 ozs. " Cotton Wool
2 Compressed Bandages, 3 inch
1 Sterile Throat Swab in Parcel Post Box. | 3 Compressed Bandages, 2 inch
4 " 1 inch
3 yds. Adhesive Plaster 8 in. wide (in roll)
6 Rubber Finger Stalls
6×1 c.c. Ampoules Pituitary Principle |
|--|--|

The whole case is lined with glazed white waterproof material, easily cleaned with a wet sponge.
PRICES ARE SUBJECT TO MARKET FLUCTUATIONS.

R. SUMNER & CO. LTD.,
Surgical Instrument Makers, LIVERPOOL

PLATE I

ADRENAL VIRILISM

(J. R. CHARLES)



Fig. A.—A case of suprarenal hypertrophy.

*Plates I and II by kind permission of the
'Bristol Medico-Chirurgical Journal'*

Valentine's Meat-Juice

In all **Wasting, Acute or Febrile Diseases**, where the **Digestive Organs** are **Impaired**, **Valentine's Meat-Juice** demonstrates its **Ease of Assimilation** and **Power** to **Sustain** and **Strengthen**

When Other Food Fails

The quickness and power with which **VALENTINE'S MEAT-JUICE** acts, the manner in which it adapts itself to and quiets the stomach, its agreeable taste, ease of administration and assimilation, have won for it the approval and endorsement of many medical men of Europe, America, etc.



VALENTINE'S MEAT-JUICE CO.

RICHHMOND, VIRGINIA, U.S.A.

PLATE II

ADRENAL VIRILISM—*continued*

(J. R. CHARLES)



Fig. B.—Same case viewed from the front.



Female "cyclical" hormone.

Amongst the first œstrus-producing hormones to be standardised by the vaginal smear method, and containing the hormone which has been obtained in crystalline form by Doisy in America and by Butenandt in Europe.

INDICATIONS

Particularly in all conditions of diminished ovarian secretion.

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DELAYED PUBERTY, etc.

[Bottles of 30, 60 and 250 dragées (150 M.U.)]
[Boxes of 6 × 1 c.c. ampoules (100 M.U.)]



An Analgesic

of pronounced value in the symptomatic treatment of Menstrual Pain, etc. Induces rapid and protracted analgesia with—in therapeutic doses—no toxicity or carry-over effects

Tablets—Powder



An Hypnotic

which induces restful, refreshing sleep resembling the natural, in all forms of Insomnia. Its ready solubility implies rapid effect and speedy elimination, with freedom from secondary symptoms

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PLATE III

ADRENAL CORTICAL HYPERPLASIA

(L. R. BROSTER and H. G. HILL)



Fig. A.—Adrenal virilism. Masculine muscular build, small breasts, male distribution of hair, especially on the chest.



Fig. B.—Acharl-Thiers type—obesity and hirsutism, side view. Note obesity limited to trunk. Downy blanket of hair over shoulders and on limbs. Mutton-chop whiskers (not seen).

*By kind permission of the
'British Journal of Surgery'*

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Digestibility

The preparation renders the curd of Lactogen exceedingly light and flocculent, very similar to that of breast milk. The emulsification of the fat reduces the globules to a very fine state of division. Both these factors contribute to the ease with which Lactogen may be digested by even the most delicate infant.

Lactogen is a modified dried milk for use in infant feeding—prepared in England by Nestlé's, from the rich, pure milk of selected English herds.

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PLATE VI

RADIOTHERAPY OF BONE TUMOURS

(H. HELNER)



Fig. A.—Ewing's sarcoma of the radius in a fifteen-year-old boy. The skiagram shows a spontaneous fracture healing.



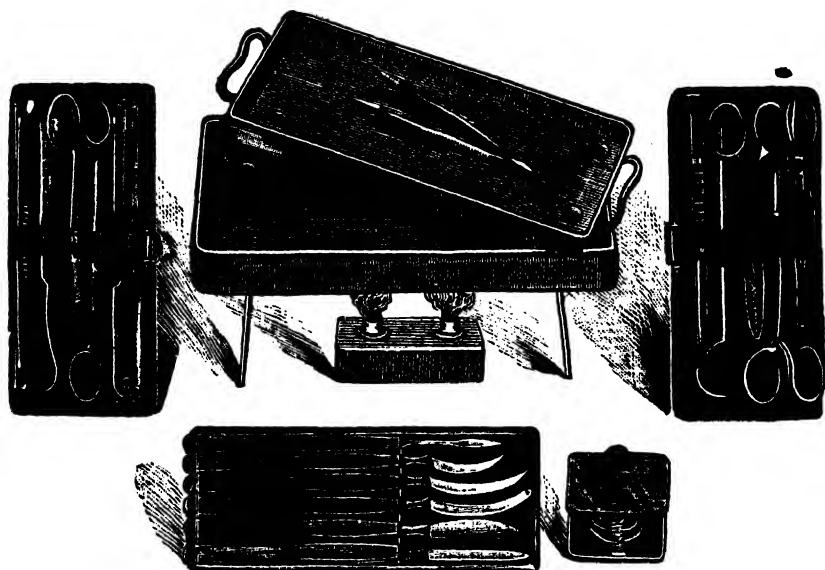
Fig. B.—The same as *Fig. A* six months later after deep X-ray therapy.

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ASEPTIC MINOR OPERATING INSTRUMENTS

WITH

SEAMLESS METAL CASE STERILIZER.



ALL the Instruments are strictly aseptic, and of the highest finish. The Knives, of the best English make, are forged out of solid steel.

When not in use the Instruments lie on nickel-plated trays in the metal case or sterilizer, which is enclosed in an outer case, the dimensions being 8 by 3 inches.

The Metal Case or sterilizer is seamless, being stamped out in one piece, and nickel-plated. It is supplied with Stand and Lamp.

The following is a list of contents :—

Needle Holding Forceps
Straight Aseptic Dressing Scissors
Curved ditto ditto
Splinter Forceps
Combined Spatula and Tongue
Depressor, with Frænum Slit
Tenaculum

Spring Forceps
Spencer Wells' Forceps
Pean's Artery Forceps
Double Volkman's Spoon
Director and Aneurism Needle
Two Probes
Six Operating Knives
Needle Case with six Needles

Price for the whole set complete - **£4 4s. 0d. nett.**
(Export Price - **£4 8s. 0d. Postage Paid.**)

SUBJECT TO MARKET FLUCTUATIONS.

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PLATE VII

CLEFT PALATE OPERATION

(G. M. TORRANCE)

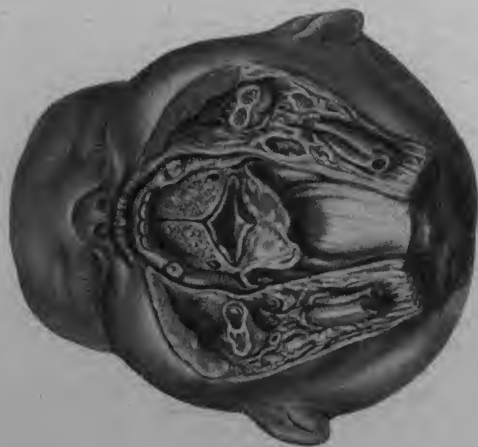


Fig. A.—The repair of cleft palate by Torrance's method. This figure illustrates the early stage of the operation. The mucoperiosteum has been detached from the hard palate and the muscular attachments of the soft palate to the posterior edge of the hard palate have been divided.

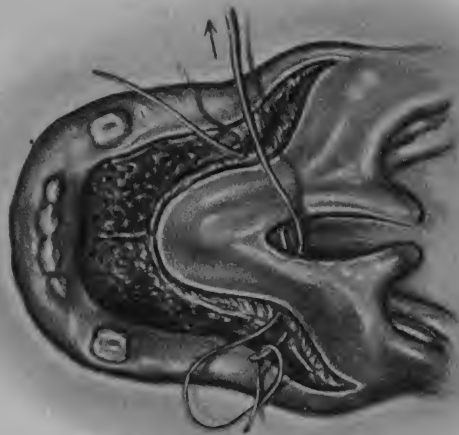
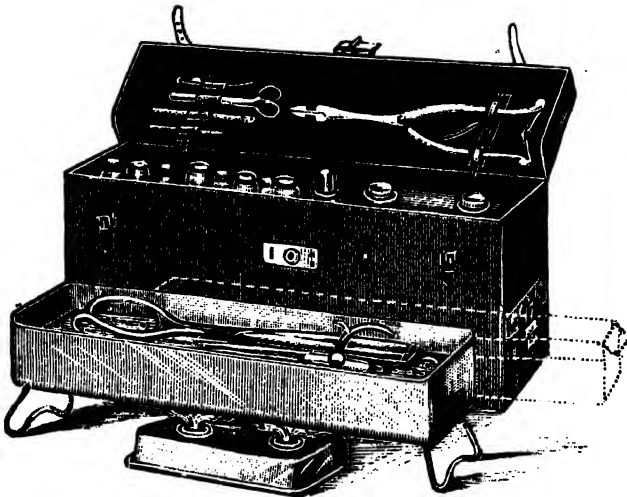


Fig. B.—The repair of cleft palate by Torrance's method. The 'push-back' procedure has been completed and the defect of the soft palate is being sutured.

MODERN AND IMPROVED **MIDWIFERY BAG** **WITH STERILIZER**



THE BAG is made of cowhide (either black or brown) and has a compartment beneath into which the Sterilizer fits.

THE STERILIZER has no seams, being blocked out in one piece from a solid metal sheet and heavily nickel plated.

The larger instruments are carried in Sterilizer, the top portion of the bag being reserved for Nail Brush, Lamp, Chloroform Bottle, Pill and Medicine Bottles, Dredger, leaving room for Apron, Gloves, &c.

The inside Cover has loops arranged for carrying the smaller instruments.

PRICE of the bag, together with STERILIZER, LAMP, NAIL BRUSH and SOAP IN CASE, MINIM MEASURE IN CASE, CHLOROFORM DROP BOTTLE IN CASE, DREDGER, 3 PILL BOTTLES, 3 MEDICINE BOTTLES IN PLATED CASES :—

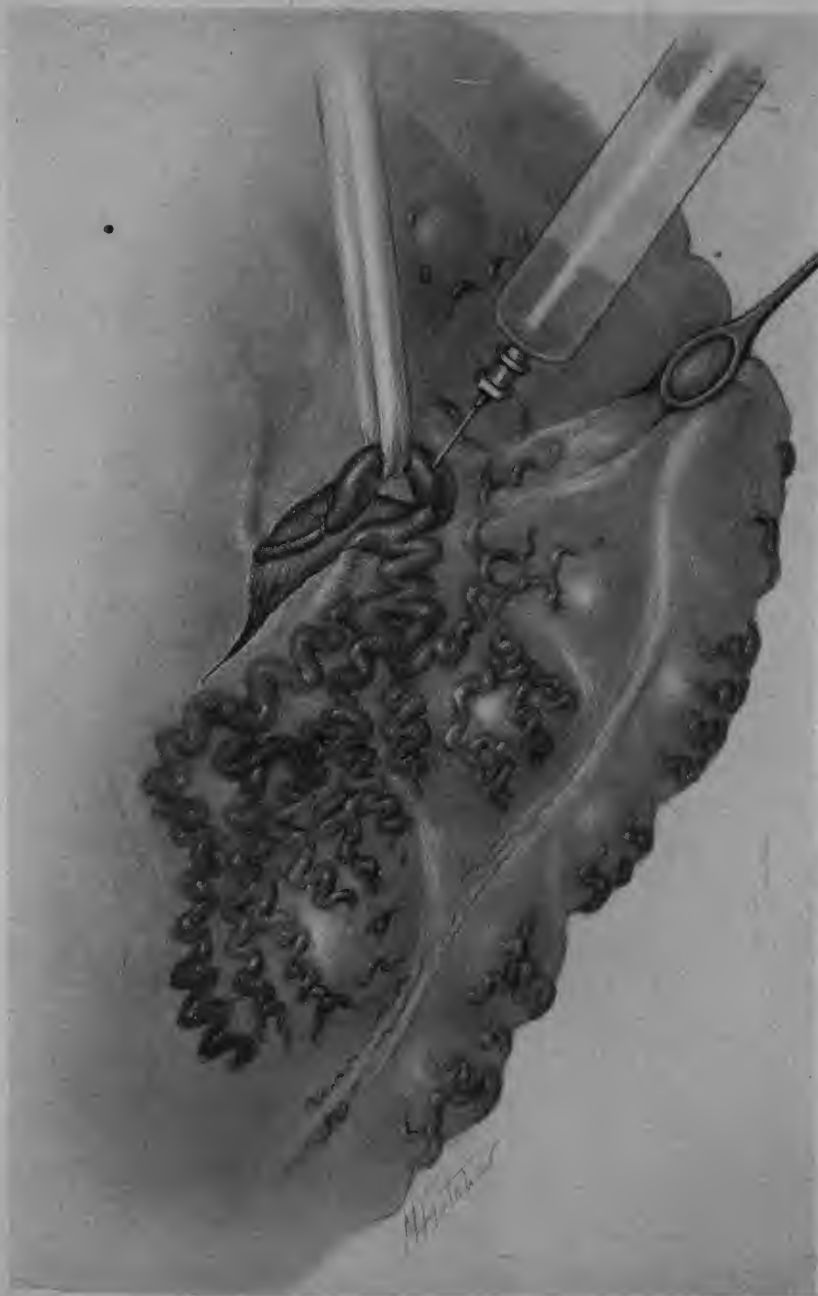
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An outside Canvas Cover can be supplied at 15/9 extra nett.

FOR EXPORT ADD 12/- FOR POSTAGE. Subject to Market Fluctuations.

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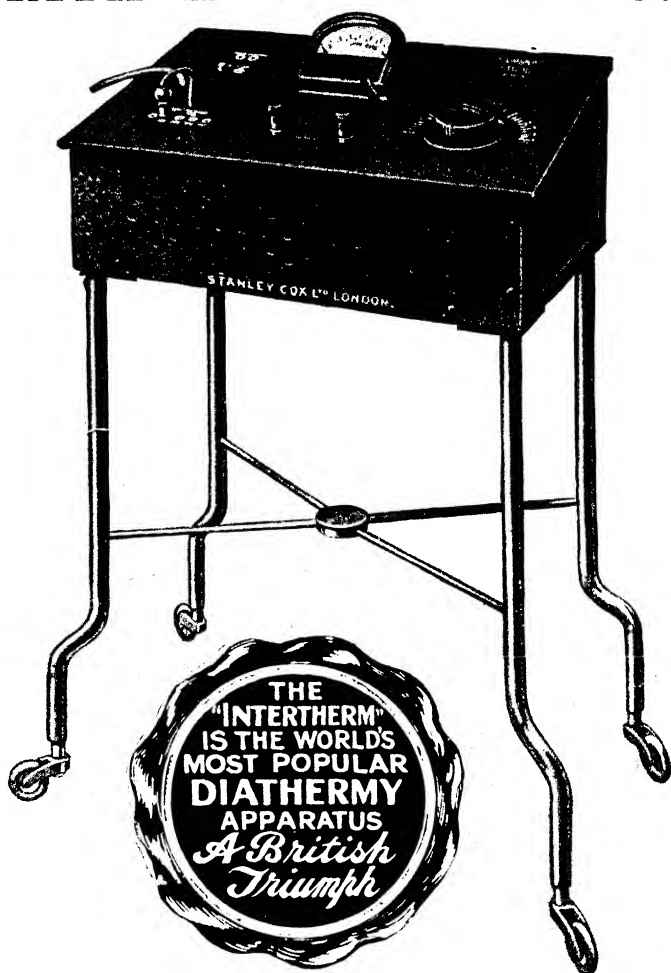
PLATE VIII
HÆMANGIOMA OF THE SIGMOID
(F. W. BANCROFT)



Artist's sketch taken at operation. Injection of the superior hæmorrhoidal vein with sclerosing solution.

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THE "JUNIOR INTERTHERM" DIATHERMY APPARATUS



The Model illustrated (No. DN 82) is ideal for use in **Small Hospitals, Consulting Rooms, etc.**

SPECIAL FEATURES: Silent Tungsten Spark-gap; Output up to 3,000 milliamps.; Control from Absolute Zero.

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Manufactured by

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Catalogue (150 pages) describing the latest British Electro-Medical Apparatus, sent free on request.

PLATE IX

INTESTINAL POLYPOSIS

(R. BENSUADE, P. ILLEMAND, AND P. AUGIER)



So called 'essential' intestinal polyposis in a man of 40 (13 cm. above the anus).

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PLATE XII

GAS GANGRENE



Sloughing abdominal wall and gluteal region from *B. welchii* infection after operation for removal of appendix.

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CONDENSER DISCHARGE
APPARATUS.

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STANDS FOR THERAPY
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PLATE XIII

GASTROSCOPY IN GASTRIC ULCER

(F. MOUTIER)



Fig. A.—Shallow ulcer of the lesser curvature seen from in front.

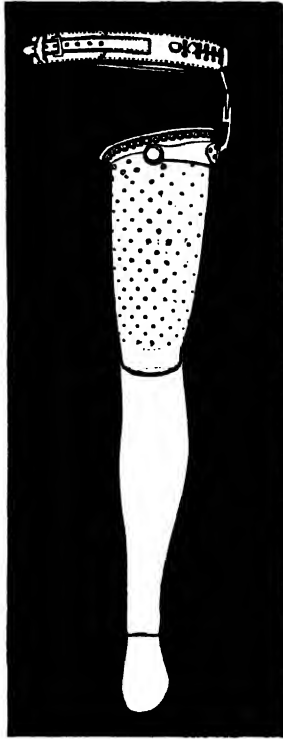


Fig. B.—Deep ulcer of the lesser curvature (gastric angle) seen in profile. Towards the pylorus blood is flowing in channels formed by folds in the antrum.

*Plates XIII and XIV by kind permission of
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PLATE XIV

GASTROSCOPY IN GASTRIC ULCER—continued

(F. MOUTIER)



Fig. C.—Sinuous hæmorrhagic ulcer of the lesser curvature, with intense gastritis. The antrum is seen in perspective, bounded above and below by the lesser and greater curvatures respectively.



Fig. D.—Gastro-enterostomy. Peptic ulcer formed around a ligature.

SURGICAL BELTS ALONE DEAL WITH THE ROOT CAUSES OF INTERNAL DISPLACEMENTS

The mechanical engineering of the abdomen in cases of internal displacement is now the first concern of patient and physician. X-ray photographs reveal irrefutably that aperients and intestinal antiseptics are futile in such cases. The long and frequently disappointing records of surgical intervention of a formidable and dangerous kind, show clearly how little this form of treatment achieves. The medical profession is beginning to realise that the surgical belt—giving upward support—can alone deal successfully with the root cause of mankind's tendency to sag—the downward pull of gravitation.

Domen surgical belts are constructed to give ample upward support from the only anatomically legitimate foundation—the pelvis. And they do this without harmful pressure—without embarrassment to the patient. Domen belts are designed for specific complaints and are strong, durable and light. Full information will be sent on receiving your card or a telephoned request.

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PLATE XV

DEEP LIOMATA OF THE HAND

(FRANCIS H. STRAUS)



Fig. A.—Epivaginal lipoma beginning at base of 4th flexor tendon-sheath.



Fig. B.—Extension distally along lumbrical tendons.

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PLATE XVI

DIAPHRAGMATIC HERNIA

(PHILEMON E. TRUESDALE)

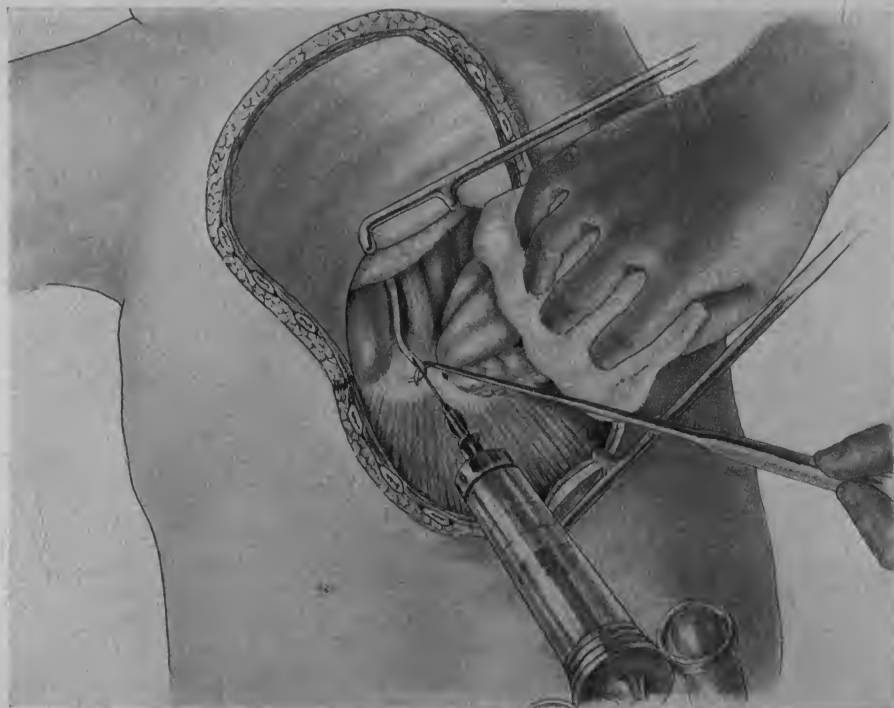


Fig. A.—Injecting the phrenic nerve with 2 per cent novocain.

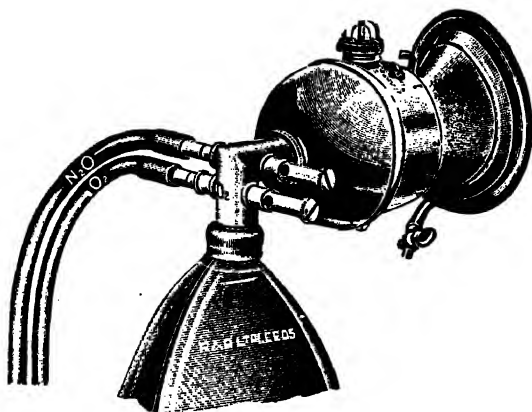
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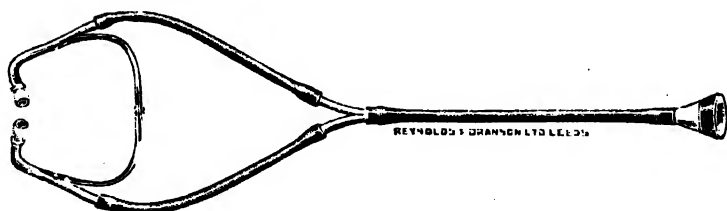
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PLATE XVII

DIAPHRAGMATIC HERNIA—continued

(PHILEMON E. TRUESDALE)

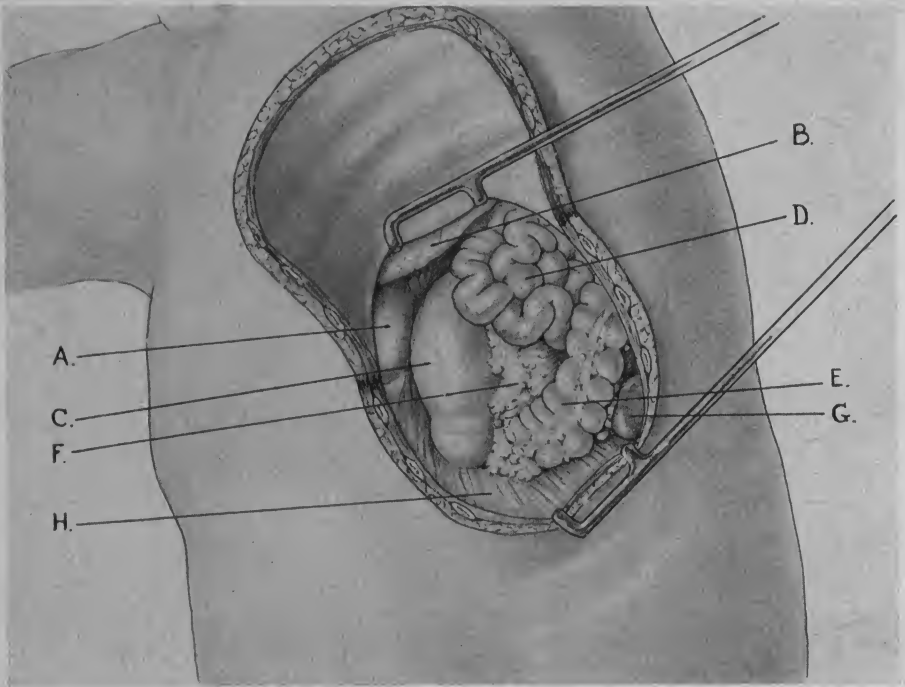


Fig. B.—Exposing contents of pleural cavity through a lapel incision. A, Heart; B, Left lung; C, Stomach; D, Small intestine; E, Colon; F, Omentum; G, Spleen; H, Diaphragm.

Elixir Glandophosph. Conc. (R. & B.)

A Mixed Gland Tonic Elixir containing the following:—

Suprarenal W.G.	Pituitary W.G.	Ox. Gall
Thyroid	Ovarian W.G.	Pepsin
	Testes	

with the Glycero-phosphates of Manganese, Potassium and Sodium.

This preparation is indicated in nervous and general debility in either sex, and is worthy of trial in cases where ordinary tonics have failed to produce or maintain good results.

Dose : One drachm three times daily, before food. **PRICE 6/6 per lb.**

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An oily Nebula for use in Nasal Catarrhal conditions. Of great value in Hay Fever, etc., leaving the inflamed mucous membrane soothed and comfortable.

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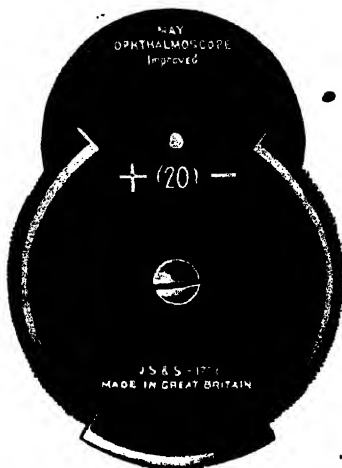
PLATE XVIII

DIAPHRAGMATIC HERNIA—*continued*

(PHILEMON E. TRUESDALE)



Fig. C.—A right-angle adjustable seat on the operating table, supporting the patient in a sitting position.



1933 SUPER ELECTRIC AURISCOPE

— With DURALUMIN HANDLE, —
RHEOSTAT CONTROL and CLIP,
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“QUICK RELEASE” BASE CAP—
can be withdrawn with a half turn.

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GLASGOW, W.2.

PLATE XIX

OPERATION FOR MEGALOCOLON

(V. ORATOR)

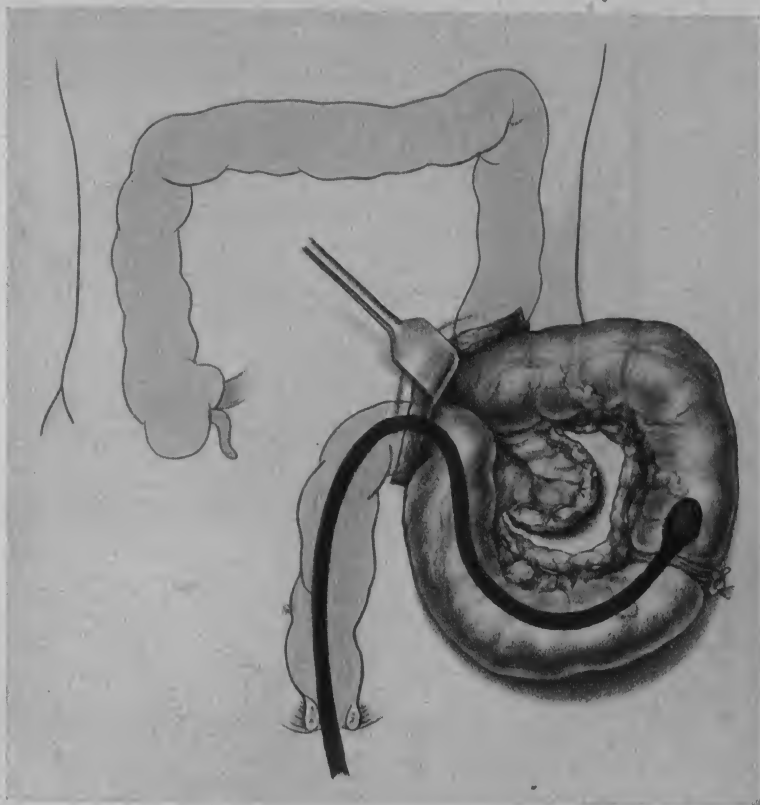


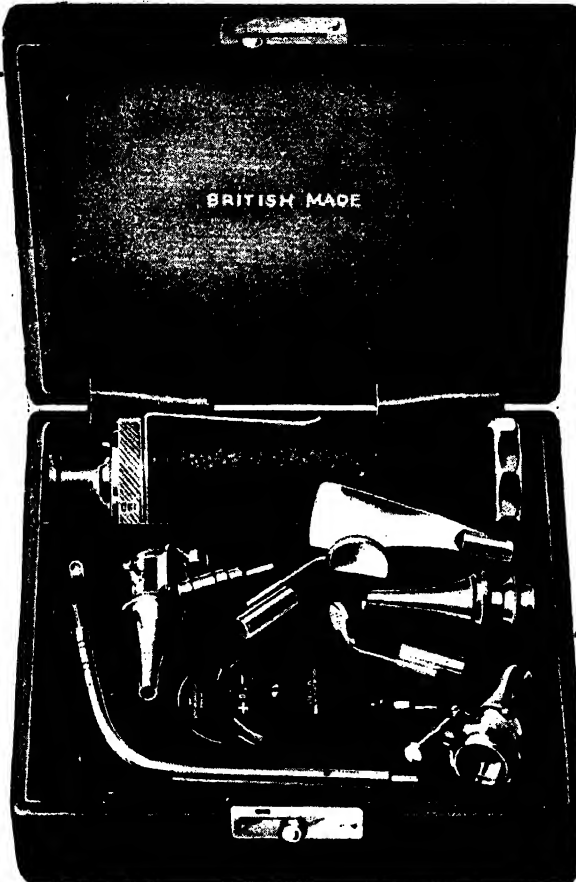
Fig. A.—The segment of affected colon is isolated from its mesocolic attachments and a probang is introduced into the bowel from below preparatory to intussuscepting the bowel within the pelvic colon and rectum.

*Plates XIX and XX redrawn from
'Zentralblatt für Chirurgie'*

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DIAGNOSTIC SET

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MAY ELECTRIC OPHTHALMOSCOPE

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24 Spherical Lenses.

ELECTRIC AURISCOPE.

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complete with Lamp.

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SUPER SETS are the finest made—AND BRITISH.

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Manufacturers,*
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PLATE XX

OPERATION FOR MEGALOCOLON—*continued*

(V. ORATOR)



Fig. B.—The segment of affected colon has been intussuscepted.

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per box.

A Laxative, Refreshing and Medicated
FRUIT LOZENGE

Price 3/-
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FOR THE TREATMENT OF

**Constipation, Headache, Indigestion, Bile,
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Warranted to contain neither Mineral nor Drastic.

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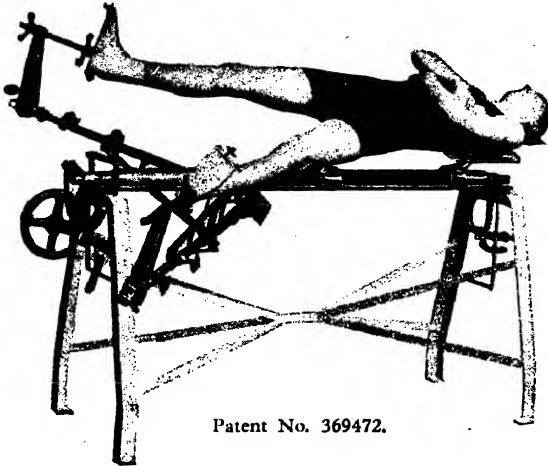
PLATE XXI

SYMPATHECTOMY FOR HIRSCHSPRUNG'S DISEASE



Fig. A.—Showing loop of pelvic colon in a child aged 2 years, before operation.

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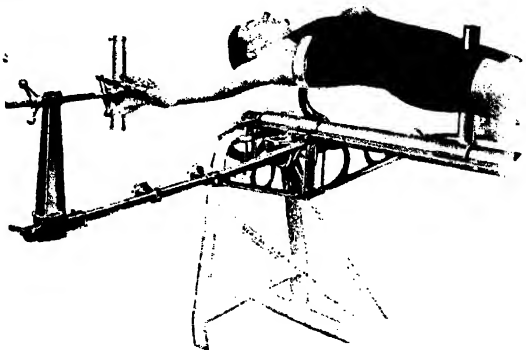
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PLATE XXII

SYMPATHECTOMY FOR HIRSCHSPRUNG'S DISEASE—*continued*



Fig. B.—Skiagram of patient seen in *Fig. A* seven months after conservative sympathectomy. In this case several inches of the sigmoid above the recto-sigmoid junction were of normal size.

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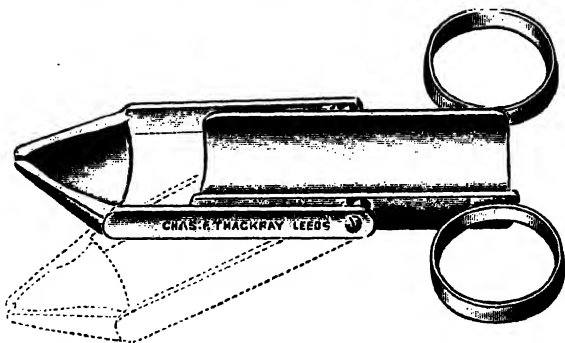
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PLATE XXIII

INTUSSUSCEPTION

(O. F. LAMSON)



Fig. A.—Intussusception before reduction.



Fig. B.—Intussusception reduced. Method of suturing ileum to cecum.



Fig. C.—Cross section showing sutures in place and out-folding of ileum over cecum.

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PLATE XXV

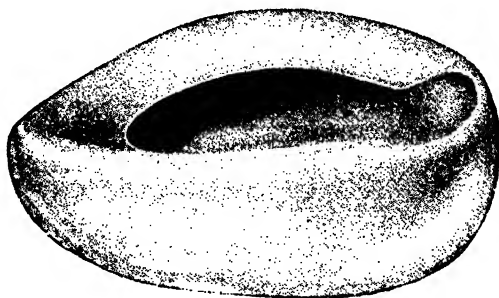
SUB-ACUTE INTUSSUSCEPTION—*continued*

(REGINALD MILLER)



Fig. B.—Barium meal: at 6 hours.

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PLATE XXVI

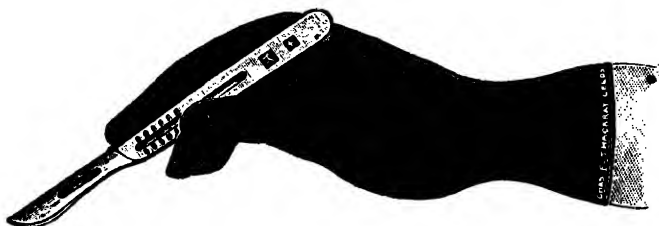
SUB-ACUTE INTUSSUSCEPTION *continued*

(REGINALD MILLER)



Fig. C.—Barium meal: at 24 hours.

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PLATE XXVII

EXPOSURE OF THE KNEE-JOINT

(H. B. DEVINE)

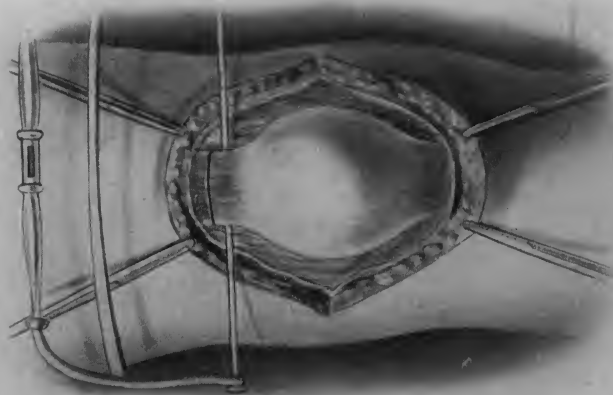


Fig. A.—Beginning of the longitudinal (coronal) saw-cut through the patella.



Fig. B.—Full exposure of the knee-joint.

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PLATE XXVIII

NEPHROSTOMY

(CH. CABOT AND W. W. HOLLAND)



Fig. A.—Method of introducing uterine sound into pelvis, passing it out through renal cortex, and attachment of silk guide.

MEDICAL ANNUAL, 1933

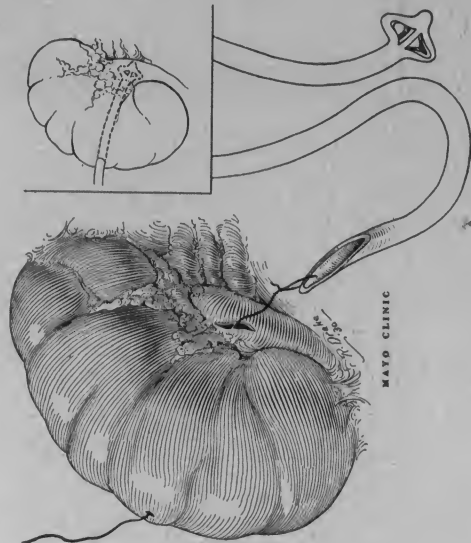


Fig. B.—Use of silk guide to draw winged catheter into proper position in renal pelvis.

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PLATE XXIX

NEPHROPYCELOTOMY

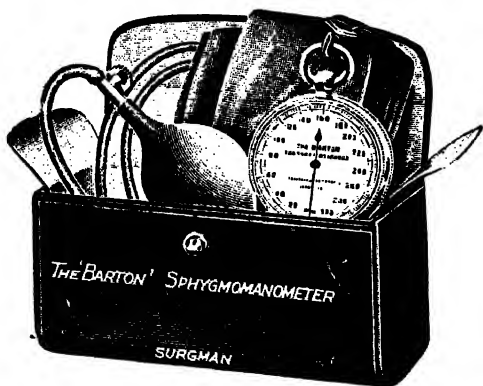
(M. ZONDEK)



Macerated preparation showing the relation of the renal artery (A) and its ramifications to the ureter (U), pelvis, and calices. The lines K indicate the positions where radial incisions should be made.

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PLATE XXXI

ABSCESS OF THE LUNG—*continued*

(P. KERLEY)



Fig. B.—Aspiration abscess in the right lower lobe.

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PLATE XXXII

MASSIVE COLLAPSE OF THE LUNGS

(D. BAND AND I. S. HALL)



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Reprinted from "The Lancet," May 21st, 1932.]

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PLATE XXXIV

MYOSITIS OSSIFICANS PROGRESSIVA

(W. F. MAIR)



A case of myositis ossificans showing the distribution of the tumours.

*By kind permission of the
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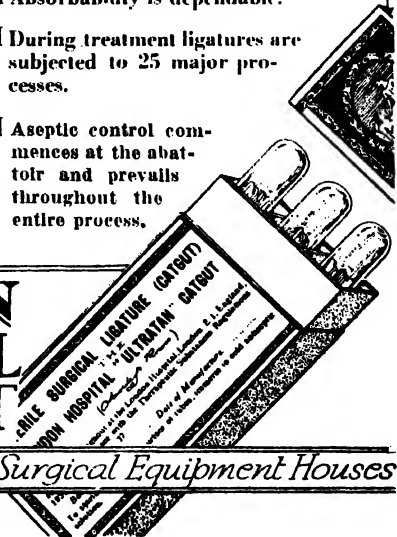
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OSTEOGENESIS IMPERFECTA

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PLATE XLII

SPLENECTOMY—continued

(D. P. D. WILKIE)



Fig. B.—Division of fascia propria of lienorenal ligament.

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PLATE XLIII

SPLENECTOMY—continued

(D. P. D. WILKIE)

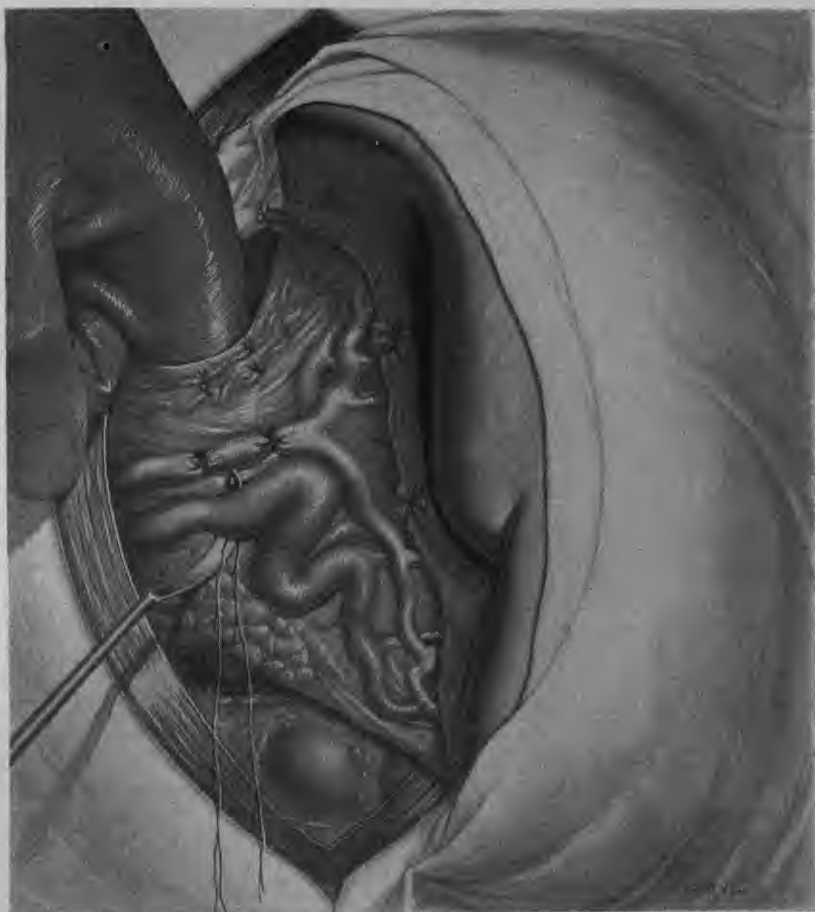


Fig. C.—Splenic artery doubly ligated; ligature being passed round vein.

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PLATE XLV

CHRONIC SUBDURAL HÆMATOMA

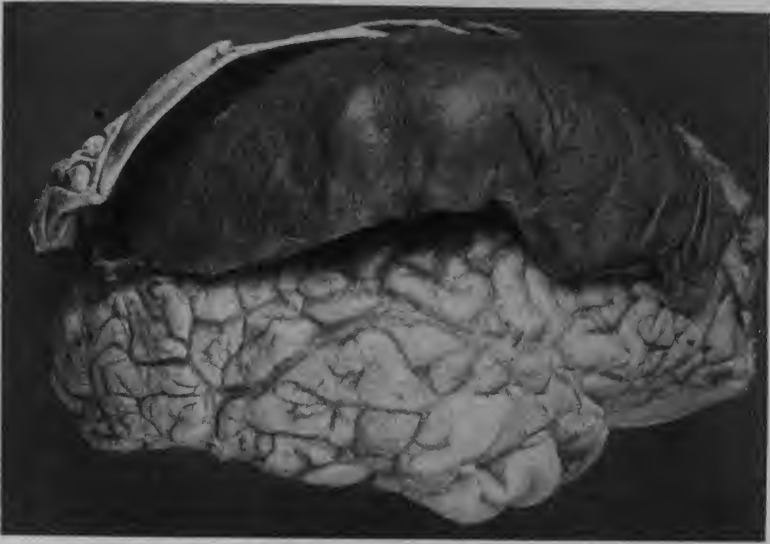
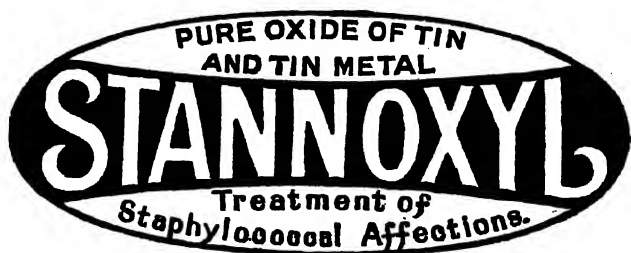


Fig. A.—Large subdural hæmatoma. (Reproduced by the courtesy of Dr. J. P. Martin.)



Fig. B.—Contents of a subdural hæmatoma as revealed on the operating table.



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PLATE XLVI

CHRONIC SUBDURAL HÆMATOMA—*continued*



Fig. C.—Calcified subdural hæmatoma, dating from birth, and showing itself in the X-ray of a lad of 19.

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PLATE LII

THYROGLOSSAL FISTULA—continued

(HAMILTON BAILEY)

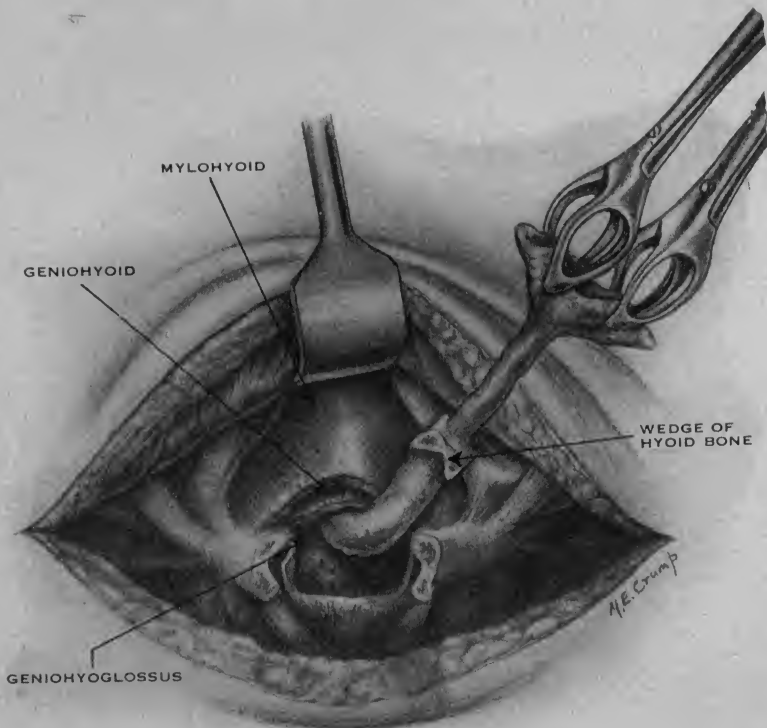


Fig. C.—The dissection nearing completion.

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PLATE LVIII

TUBEROSE SCLEROSIS—*continued*

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Fig. B.—An epilolac patient showing numerous defmal tags on the neck.

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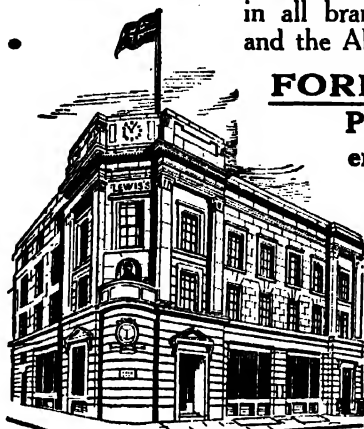
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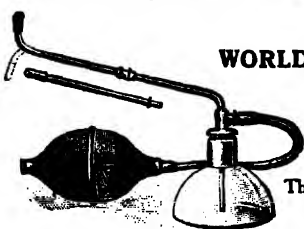
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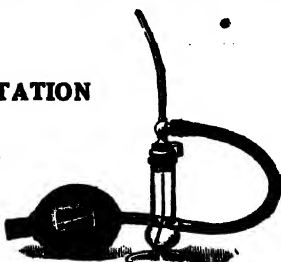
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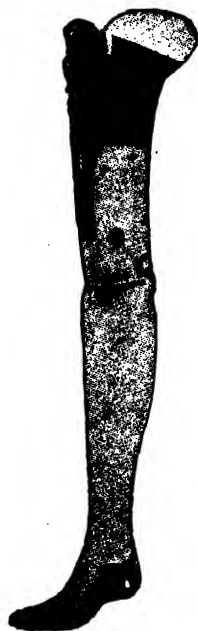
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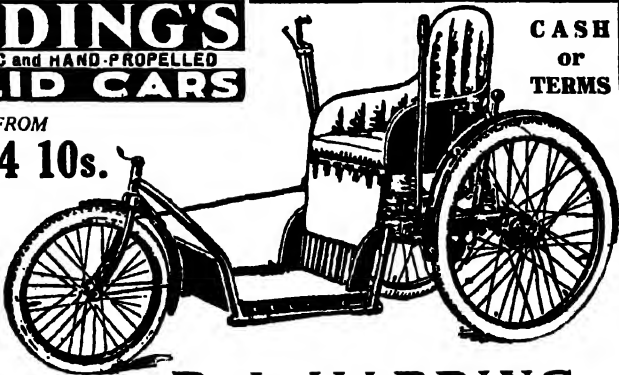
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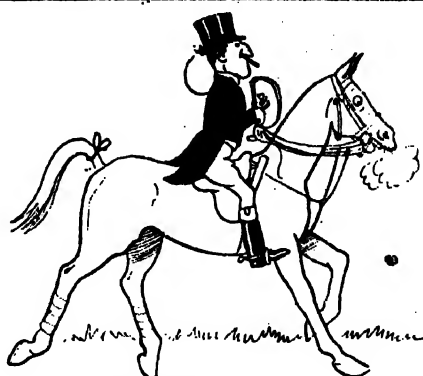
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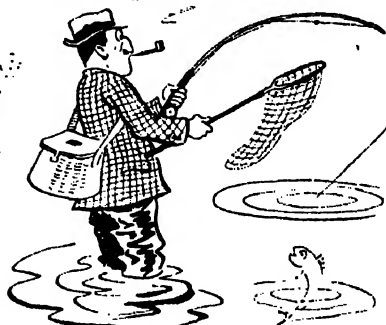
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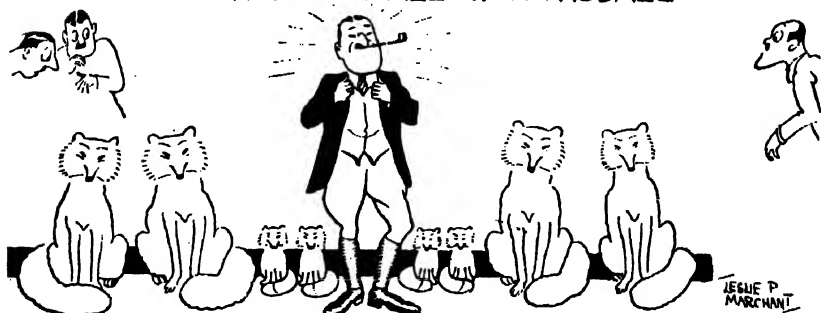


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THE MEDICAL ANNUAL, 1933

A Review of the Year's Work in the Treatment of Disease

INTRODUCTION

BY THE EDITOR.

ALTHOUGH no very striking discovery has been made in medical science during the year under review, a steady advance has been made along a wide front.

A great deal of attention has been paid to the question of achlorhydria and its associations, largely stimulated by the recent work on the etiology of the anemias. It has been shown that there is an increase in the incidence of achlorhydria from youth to old age in normal people. This study of the normal occurrence of the condition is of considerable interest in attempting to assess its significance in any given case. Of itself achlorhydria usually produces no symptoms and calls for no treatment. Thus, as our reviewer states, its importance at the moment tends to be exaggerated.

Four new physical signs are described. In cases of chronic cholecystitis the lower edge of the eighth right costal cartilage is said to be tender on pressure; there is also an area of tenderness on palpation in the right costovertebral angle. The differentiation of varicella from such diseases as herpes, dermatitis herpetiformis, and vesicular urticaria, is said to be assisted by light pressure with the index finger over the normal skin near the vesicle and then over the vesicle itself: in varicella this results in collapse of the vesicle with escape of its contents; in other diseases no effect is produced on the vesicle by this procedure. The fourth new sign, when elicited, is said to be diagnostic of bronchial asthma: in this test manual pressure is made on the chest during expiration, and in certain cases of asthma this produces high-pitched sibilant rhonchi.

A very comprehensive review of lung abscess is given, and it is surprising to see how good is the prognosis, and what a large number of cases of this condition recover when treated by simple medical methods. A plea is put forward for the conservative management of the bowels in lobar pneumonia; it is urged that artificial motions produce much discomfort and exhaustion for the patient with little or no compensatory beneficial effect. In this disease, too, it is claimed that artificial

pneumothorax may be of the greatest value; the operation is said to relieve pain immediately and to be followed by considerable improvement in the general state of the patient; so great is this improvement that it may at times simulate a natural crisis. The increasing incidence of malignant disease of the lung has led to more detailed investigation of its radiological appearances. Two main types are described. In one form, the 'pneumonic', a lobe, or even the whole lung, is involved in the process. In the other, the 'hilar' form, there is a dense opacity around the root of the lung with little or no collapse or consolidation at the periphery. These two types as a rule maintain their distinctive appearance to the end. Diaphragmatic palsy is a valuable sign, since the commonest cause of paralysis of the phrenic nerve, apart from surgical evulsion, is cancer of the lung.

A review of the main features of the new British Pharmacopœia, the publication of which was one of the notable events of last year, is presented. This is followed by a complete posological table of the official drugs. Perhaps one of the most important advances recorded in this issue is the evaluation of the new synthetic anti-malarial preparation atebirin. This drug appears to be complementary in its action to plasmoquine, as it destroys the parasite in the non-sexual stage but has little effect on the crescents. In treatment atebirin compares very favourably with quinine, and is superior to the latter in preventing relapses and for prophylaxis. It is pointed out that for really successful treatment of trypanosomiasis large doses of tryparsamide are essential. The value of carbon-dioxide and oxygen therapy in various conditions of embarrassed respiration is emphasized in several articles.

A new risk to motor drivers is described as 'Driver's Thigh'. If the springs of the driver's seat are broken, or if the seat is tipped too acutely, the pressure of the edge may cause fatigue, pain, or actual sciatica. The right leg is as a rule the one affected, from its continual use with the accelerator pedal. Cases of 'acute febrile polyneuritis' have again been described and the cerebrospinal fluid findings appear to be diagnostic; the fluid is yellowish in colour, with greatly increased protein but with very little cellular increase. The prognosis is usually good both as to life and functional recovery. Neuritis may also occur as one of the neurological complications following serum therapy. In most cases the nervous symptoms are associated with the usual features of serum sickness. Complete recovery occurs, but this may be delayed for as long as twelve or eighteen months. In that form of neuritis associated with early toxæmias of pregnancy, however, the outlook is less good. At the Centenary Meeting of the British Medical Association considerable attention was paid to the clinical features of disseminated sclerosis. Among other things the importance of retrobulbar optic neuritis as an early symptom was emphasized. It is stated that with a few rare exceptions disseminated sclerosis is the only cause of an acute unilateral retrobulbar optic neuritis. It is interesting to note also that in a small proportion of cases trigeminal neuralgia may occur as a symptom of disseminated sclerosis.

The interesting work on the etiology and treatment of pernicious anæmia described in our last number has been continued. An important aspect of this year's work is the discovery that fish liver and its extract is as efficient as mammalian liver in inducing and maintaining a remission in this disease. This advance should not only lessen the cost of living for pernicious anæmia patients but also improve the outlook for the British fishing industry. It appears to be definitely proved that certain cases of pernicious anæmia, but not all, may be cured by treatment with large doses of vitamin B. The exact relationship that vitamin B bears to the anti-anæmic factor in liver is still obscure, and at the moment preparations of the vitamin cannot be used as a substitute for liver with any great confidence. In subacute combined degeneration of the cord it has been disappointing to see that while treatment with liver might prevent any further progress of the disease it had little if any effect on the established lesions. Now, however, it is claimed that large doses of iron will materially improve these patients. If this is substantiated it should throw considerable light on the relationship between subacute combined degeneration of the cord, pernicious anæmia, and simple achlorhydric anæmia. Anæmias of infancy, which have hitherto been so confusing, have also received attention. They have been classified into four large etiological groups, with consequent simplification in both diagnosis and treatment. It is suggested that the value of iron in certain anæmias may be due, in part at any rate, to the copper contained as an impurity in the preparations commonly used. It appears that the copper acts in some way as a catalyst and that this action is essential for the full use of iron in the manufacture of hæmoglobin. Chemically pure iron has little or no effect on certain experimental anæmias which are rapidly cured when a trace of copper is added to the iron.

It has been shown that 'heat cramps' or 'the bends' are virtually a form of acute water poisoning. These distressing symptoms are occasioned by hard physical exertion in extreme heat. This results in excessive sweating by which large quantities of salt and water are lost. The water deficiency produces intense thirst, which is satisfied by the consumption of plain water, and thus a condition of salt depletion and water saturation occurs. The condition may be prevented by drinking 0.5 per cent salt solution instead of plain water. The use of a similar drink by soldiers on the march and by 'hikers' is said to prevent fatigue to a large extent.

Unfortunately the chemical estimation of alcohol in the urine has proved of little value in the diagnosis of drunkenness. The analysis is only of significance when alcohol is present in high concentration, and in these cases the diagnosis is obvious without the aid of chemistry.

In the treatment of heart disease it is becoming more and more recognized that the use of digitalis is by no means restricted to cases of auricular fibrillation. It has been shown that considerable relief from attacks of paroxysmal nocturnal dyspnoea (cardiac asthma) may be obtained

by efficient digitalization. The value of digitalis in ventricular failure with normal rhythm has also been confirmed and a large number of cases have been found to respond to the exhibition of this drug. Of those cases which resist treatment with digitalis some will receive much benefit from large doses of urea. This in certain cases results in a copious diuresis with considerable symptomatic relief.

The reduction in the number of deaths from diabetic coma has been associated with an alarming and increasingly large number of diabetic deaths from cardiovascular complications. It is hoped that by the use of the 'high carbohydrate' diets noted in our last issue, and with the consequent reduction in the amount of fat consumed, this increase in the incidence of arterial degeneration may be checked. An interesting therapeutic discovery is that in persistent *B. coli* infections of the urinary tract the successful adoption of a ketogenic diet often clears up the condition.

Considerable interest centres round the description of 'pituitary basophilism', under which name Cushing has drawn attention to a curious polyglandular syndrome. This condition has up to the present been ascribed to a cortico-adrenal dysfunction. It consists of adiposity, genital dystrophy, high blood-pressure, polycythaemia, and hirsuties of male type. Six out of eight cases of this condition have been definitely shown to have had pituitary adenomas of the 'basophil' type.

Our reviewer in general surgery refers to the well-known fact that fracture of the os calcis may be followed by persistent disability, and describes and illustrates methods intended to pull and press out the crushed bone to something like its original shape. One of the most interesting of new operations is removal of a parathyroid tumour—which has to be cut down upon to demonstrate it, as it cannot be felt through the skin—to cure generalized osteitis fibrosa associated with too much calcium and too little phosphorus in the blood. Unfortunately, tetany may follow a too extensive removal of the parathyroid. Information of real value may be obtained by injecting lipiodol into the duct of the parotid gland and obtaining a 'sialogram'. Probably most surgeons of experience have learned that the application of the ordinary round-rubber tourniquet to the arm may cause paralysis; the inflatable pneumatic tourniquet is safe. A chemical substance called stryphon is well spoken of as a local application to stop bleeding. A method of skin grafting by pushing tiny fragments into the granulations of a raw surface often succeeds when Thiersch grafting would fail. It is advised that a long track extending to the foramen caecum, through the hyoid bone, must be excised to cure a thyroglossal fistula. Postoperative thyrotoxicosis after removing a goitre may be arrested very dramatically by intravenous injection of sodium iodide.

An aluminium plate shaped like an Army 'tin-hat' is better than a rubber shield to wear over a colostomy. A method of operating for inguinal hernia from within the abdomen is described from India. Two good papers on the diagnosis and treatment of diaphragmatic hernia are

abstracted. Attention is directed to the so-called 'period of silence' after rupture of the spleen, which may be followed by a disastrous internal hæmorrhage; there is usually a dull ache in the splenic region, and there may be a history of delayed syncope coming on a few minutes after the injury. A good account is given of the operation of splenectomy, which is inadequately described in the text-books on operative surgery. Surgeons would do well to give their gastric cases a copy of the instructions printed in our article on the surgery of gastric and duodenal ulcer. *

Peri-arterial sympathectomy is receding from favour, and resection of the ganglion-chain is taking pride of place; it is valuable for conditions of arterial spasm such as Raynaud's disease and thrombo-angiitis obliterans, as well as for megacolon. A method of operating for late intracranial hæmorrhage by boring four small holes instead of turning down a large flap of skull is described.

A long follow-up of cases from the American Register of giant-celled central tumours of bone shows that about 8 per cent eventually get a metastasis. Curetting is not a satisfactory method of treatment. A promising new method of operating for ununited fracture of the neck of the femur by approaching through the great trochanter is described. Another new bone operation that may probably be found useful is designed to fix the ankle-joint. It is recommended not to gutter the shaft of a bone for acute osteomyelitis, but to bore a few holes.

Our reviewer on the surgical ailments of children comments on the good success obtained by operating late rather than early in the pneumococcic peritonitis of little girls. The undescended testis may be brought down into its proper place without spoiling its blood-supply by opening the abdomen to free the cord at the internal ring, and it may be kept down by attaching the scrotum and testis to the thigh for a while. Malignant tumours of the kidney cannot be treated successfully either by radiation or surgery, but X-ray or radium-pack treatment followed by nephrectomy gives good results.

A paper on artificial pneumothorax in the treatment of pulmonary tuberculosis reports about 60 per cent able to lead normal lives, whereas in a comparable series treated by other methods 70 per cent were dead in five years. Phrenicotomy also has attained to a definite place in the treatment of the disease. The more considerable operations are still *sub judice*. Acute abscesses of the lung are better let alone.

The pain of cystitis is relieved by injections of liquid paraffin. Priapism, a troublesome complication of circumcision in adults, may be prevented by giving the patient an ethyl-chloride freezing spray to use. The cautery-knife has its uses in genito-urinary surgery; the tunica vaginalis in a hydrocele operation may be divided with it, and it may be used to split the kidney in nephrolithotomy. Malignant growths of the testis are often diagnosed too late; if there is any enlargement of the organ and the cause is not obvious, it ought to be explored under

local anæsthesia, when growth, gumma, or hæmatocele can be readily distinguished. Great interest is being taken in the operation of partial removal of the prostate by electrical methods *per urethram*; in the opinion of some, suprapubic prostatectomy will soon be an obsolete operation.

For pruritus ani, powders and lotions (formulae given) are better than ointments; X rays and radium are dangerous; Ball's operation well performed gives good results. Radium in the treatment of cancer of the rectum has proved disappointing, except for anal epithelioma.

Two important papers are reviewed dealing with radium treatment of malignant disease of the larynx, pharynx, and sinuses, for all of which it is the method of election, alone or combined with surgery or diathermy. Magnesium sulphate is recommended for the treatment of chronic otorrhœa. For stenosis of the larynx a permanent tracheostomy is the best treatment, and with a speaking-valve attachment the voice may be normal. The writer says, "I know of no serious social disadvantage entailed by a tracheotomy except that a patient cannot swim." Fibrous stricture of the œsophagus responds well to electrolysis after dilating with bougies.

Very serious injuries of the eye may follow ammonia burns, because a chemical reaction goes on for several days; usually the eye is lost. In the case of lime burns, the instillation of ammonium tartrate helps to prevent opacities. Painful absolute glaucoma can often be successfully treated by retrobulbar injections of alcohol. Readers will find a long review this year of the causation and treatment of iritis and iridocyclitis, which touches too many points to be summarized briefly. Great interest continues to be taken in the treatment of detached retina; ignipuncture gives a good result in from 20 to 50 per cent of the cases, but two new methods are well spoken of, multiple trephining and diathermy.

The section on venereal diseases includes an article on granuloma inguinale, which is apt to mimic chancroid, and can be cured by antimony or by diathermic fulguration. There is a long discourse on the treatment of gonorrhœa in women, the main points being to secure good drainage, and raise the patient's resistance. The complement-fixation test enables the latter to be estimated with some accuracy. Drainage may be secured by glycerin applications; the resistance may be raised by vaccines. The best drug-prophylactic against syphilis appears to be a bismuth injection into the muscles. Salvarsan dermatitis may be relieved by liver extract. Arsenobenzene preparations may sensitize the skin so that further injections cause violent dermatitis; tests are described to detect the danger beforehand.

Bakers are liable to a dermatitis due to a sulphate of ammonia in the yeast. Cases are recorded in which the contents of vesicles of herpes zoster inoculated into children gave rise to an exanthem apparently identical with varicella. A review of the methods of treatment of scalp

ringworm is given; X-ray depilation is the main stand-by, and gives an excellent result in 83 per cent of cases; only 0.4 per cent got any permanent alopecia, and that only small and local. Thallium acetate continues to furnish a few fatalities, but usually from gross overdosage. Ringworm of the feet in school-children and university students is common in America; iodine, sodium thiosulphate, and sodium hypochloride are recommended remedies.

Turning now to obstetrics and gynaecology, much interest is being taken in the question of the relief of pain during labour; crushable capsules of chloroform, nitrous-oxide and oxygen, pernocton, and nembutal with chloral hydrate all have their advocates. A method for inducing labour by puncturing the membranes above the child's head, by means of a stylet and catheter, appears to be the best available. There is much difference of opinion as to the relative virtues of Cæsarean section, the induction of premature labour, and 'trial labour' in the treatment of contracted pelvis; some clinics have given up induction of premature labour, and it is agreed that Nature is often able to deliver the baby in very unpromising cases.

The anæsthetists of late years have been very much alive and full of new ideas. A number of methods are being tried out to bring the patient to the anæsthetic room already more or less unconscious. The respective merits of nembutal (popular in this country), sodium amytal (the United States' favourite), avertin, paraldehyde, and sodium bromide are discussed. When the heart collapses under an anæsthetic, puncture of the right auricle is recommended. If avertin endangers a patient's life by causing respiratory depression, coramin may save the situation.

Our review of the radium treatment of cancer gives the following figures presented to a British Medical Association meeting in July, 1932. Cancer of the cervix gives a 5-year 'cure' rate of over 40 per cent in operable cases, and of about 20 per cent in all cases. Figures for cancer of the breast show 46 per cent alive (it does not say well) after three years even in inoperable growths, but the series is small. Pain after radium treatment is very seldom seen except when radium necrosis occurs, and that is due to gross overdosage or inadequate screening, and ought not to occur.

Once again it will be seen that many minds and many varieties of experience all over the world are contributing to the progress of medicine in all its branches, and with quite remarkable success. It is probably true to say that every doctor in active practice sees each year at least one case that can be better diagnosed or treated if that doctor is aware of the advances recorded in the last two or three numbers of the MEDICAL ANNUAL.

CAREY FRANKLIN COOMBS

1879 1933

WE shall not attempt here to relate the facts about the career of our late Editor. They may be found in the obituary notices in the weekly Medical Journals, but we must allow ourselves a few words of affectionate tribute to his memory.

Although it is now three months since C. F. Coombs was taken from us, it is very remarkable how his loss is still felt and spoken of in the Bristol district by all his late colleagues and the profession in general. Usually a death in medical circles is like a stone dropped on water ; there is a splash, some spreading circles of wavelets, then all is still again. Not so, in this case. There is a real gap. Friendships have suffered a painful wrench. His initiative is missed on numerous committees, for he seemed to have a hand in everything. The students are really dismayed at the loss of a most popular and successful teacher. His place in hospital and consulting practice can never be filled. We venture to believe that the profession the world over, or at least those of them who take an interest in cardiac and rheumatic diseases, will feel that some very valuable researches have been brought to an untimely end.

He was only 53 and full of schemes and work. In this sense of loss, the publishers of the MEDICAL ANNUAL, the contributors, and we think many of the readers also, will have a share.

For fourteen years he has been largely responsible for the choice of reviewers on medical subjects and for the general direction of the lines to be followed. He was constantly planning some method of helping readers in new and better ways. For ten years he himself contributed, very ably, the articles on disease of the heart. He had an immense circle of acquaintance amongst the most eminent men in the profession, in Britain and overseas, and nearly always knew where to find a good new contributor, and how to persuade him to bear a hand.

A. R. S.

DICTIONARY OF PRACTICAL MEDICINE

BY MANY CONTRIBUTORS

ABDOMINAL SURGERY, MISCELLANEOUS.

A. Rendle Short, M.D., F.R.C.S.

DIAGNOSIS.—We have had occasion previously to refer to H. Feldman's¹ view that intercostal or abdominal-wall neuralgias are common affections and often mistaken for appendicitis or other visceral disease. Such intercostal nerve pain may be due to pleurisy or pneumonia. If the tenderness disappears when the muscles are contracted, the cause lies within the abdomen; if it persists, the seat of pain is in the abdominal wall. Feldman further elaborates the distinction by giving a low spinal anæsthetic, preferably 5 to 10 mgrm. of quinidine. Skin anæsthesia will be complete up to the umbilicus in two minutes. Deep pressure will still cause pain if the cause lies within the abdomen, but not if the pain is referred from the vertebral column or the chest, or located in the abdominal wall. The explanation is that the anæsthetic reaches the spinal nerves in the dural canal some time before it ascends high enough to block the afferent sympathetic paths.

Exploratory Laparotomy.—As Zachary Cope² points out, the need for this rather unsatisfactory procedure has greatly diminished of late years, in consequence of improvements in pre-operative diagnosis, especially in the use of X rays. It is true that we fairly often have to explore to discover the operability of a palpable tumour, or for ascites, but a very small incision will usually suffice. Jaundice, or persistent vomiting, may often call for an exploratory laparotomy. Most difficult is the decision when to explore for pain, without a definite diagnosis. In chronic cases this may be due to early cancer of the stomach or intestine, ulcer of the second part of the duodenum, mesenteric lymphadenitis, or in some cases to cholecystitis or appendicitis. On the other hand, the pain may be psychic. Obviously, a very thorough clinical examination should be made. [Beware of cases in which the pain is brought on by exertion, which may be cardiac in origin; also 'slipping rib', in which a lower costal cartilage may override another; and patients whose pain depends on some bodily posture. Remember gastric crises, and lead colic, and the girdle pain of pressure on spinal nerve-roots.—A. R. S.]

Surgery of the Upper Abdomen.—B. Filho³ (Rio de Janeiro) advises that the patient be placed in a nearly vertical position on the operating table for upper-abdomen cases. The gall-bladder, for instance, descends to a level two vertebræ lower in the vertical position. The patient's arms must be brought above the shoulders and bandaged there, and a median vertical incision is advised. [We are not informed, however, whether any of the patients became faint or collapsed, or how many of them subsequently developed an incisional hernia. Four years' experience has increasingly impressed us with the value of the Sloan incision, described in the MEDICAL ANNUAL for 1929 (p. 8), for surgery of the upper abdomen. It can always be closed without tension, post-operative pain is reduced to a minimum, and the risks of incisional hernia are almost nil.—A. R. S.]

Technique.—J. O'Sullivan and B. O'Connor⁴ (Kearny, N.J.) describe a useful-looking abdominal retractor (*Fig. 1*). H. C. W. Nuttall⁵ recommends a selvedge stitch for cases where the peritoneum is very thin and tears at every attempt to sew it up. After the insertion of the selvedge stitch, the gap can be closed in the ordinary way and the sutures will no longer cut out (*Fig. 2*).

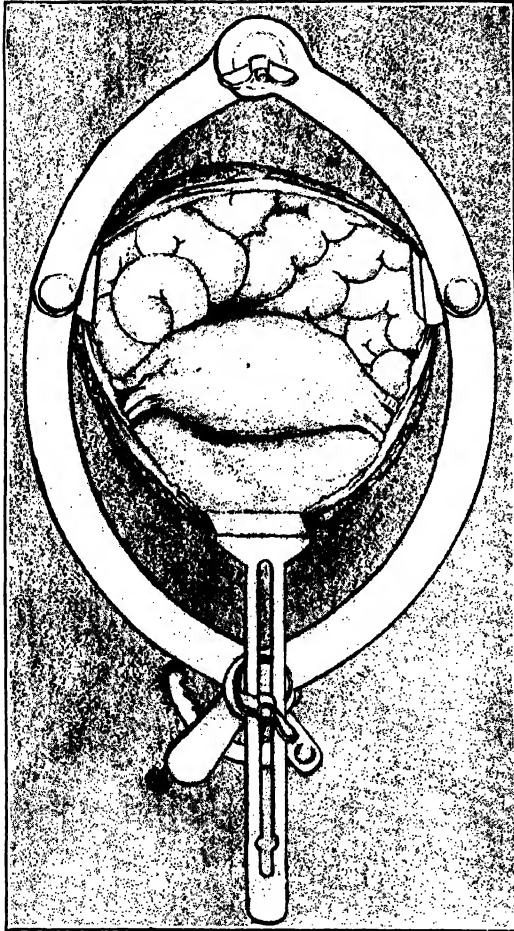


Fig. 1.—Adjustable abdominal retractor; the figure shows the lower angle retractor in place for hysterectomy, exposing the bladder and uterus. (By kind permission of the 'American Journal of the Medical Sciences'.)

Post-operative Complications.—T. G. Orr⁶ says that the best remedy for post-operative 'gas-pains' is the intravenous injection of 20 c.c. of 10 per cent hypertonic **Sodium Chloride Solution** given very slowly (five minutes). [**Pituitary Extract** is also very effectual.—A. R. S.]

F. S. Lynn⁷ (Baltimore) describes two cases of very extensive **gangrenous ulcer of the abdominal wall** following operation for appendix abscess. He has collected twenty more from the literature. They mostly recover after a long illness. The cause is unknown. The treatment recommended is to draw a circle round the whole area with the **Electric Caутery** and remove all the growing edge; the whole surface is then skin-grafted a week or two later. [I have had a similar case under my care in which the gangrene arose spontaneously, not after operation, and spread over the whole abdomen and part of the loins and thighs. Numberless methods of treatment were tried in vain, but it eventually got well after excising a ring of skin all round outside the growing edge.—A. R. S.]

Lefebvre and E. Cantegril⁸ (Toulouse) report a fatal case of **tetanus** after operation for chronic salpingitis and pelvic peritonitis, in which the small intestine was accidentally wounded. Catgut was used. They believe that the source of the tetanus bacilli was the patient's intestine. Many observers testify that tetanus germs are occasionally to be found in the human alimentary canal; the frequency is stated to be from 25 to 35 per cent. Fortunately, post-operative tetanus is rare, but the authors mention about thirty cases.

Pain persisting for months or years after laparotomy is sometimes due to injury of a nerve in the abdominal wall, and A. Ssosan-Jaroschewitsch⁹ (Swerdlow) describes four cases in which this occurred and a nodule on the nerve was found and resected, with relief of the pain. In some of these the neuroma could be felt through the skin. The scar of the skin incision is often keloid; there may be anæsthesia or hyperæsthesia of an area of skin supplied by the nerve, and atrophy of a segment of the rectus muscle.

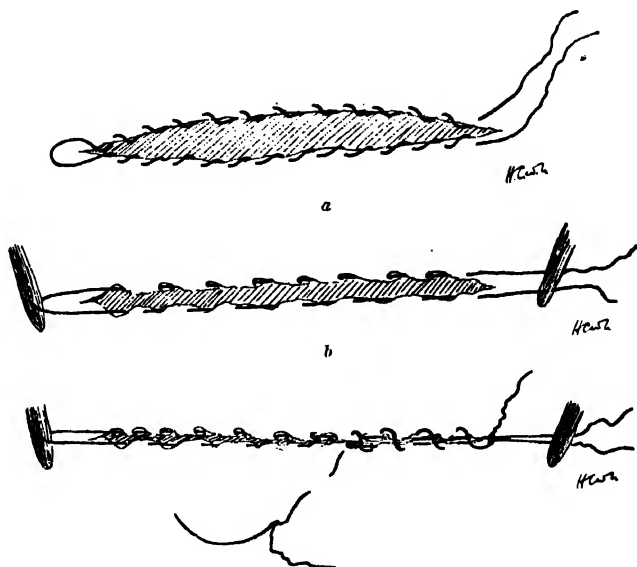


Fig. 2.—Suture of the peritoneum aided by a selvedge stitch. *a*, The selvedge stitch inserted; *b*, The two ends of this stitch pulled upon longitudinally; *c*, The usual peritoneal suture being inserted to close the peritoneum.

Anomalies of the Duodenum and Colon.—J. L. Kantor¹⁰ (New York) contributes a study based on a clinical and radiological study of anomalies of the alimentary canal, such as duodenal bands, the too-high or too-low cæcum, and redundant colon. Vague persistent symptoms are often associated with these anatomical variations, and Kantor analyses the clinical picture and X-ray findings in each group. Most of them need medical rather than surgical treatment.

Penetrating Wounds of the Abdomen.—A. E. Billings and A. Walking¹¹ (Philadelphia) present a report of 220 cases. Happily, no hospital in our own law-abiding country could furnish such a long series. In the gunshot cases, the mortality in civil life is about 50 per cent, and of the stab-wounds about 25 per cent. An important and preventible cause of death is the overlooking at operation of perforative wounds of the bowel, kidney, or liver. They recommend the more frequent use of **Blood Transfusion**, using the patient's own extravasated blood if the hollow viscera are not injured.

REFERENCES.—¹*Amer. Jour. Surg.* 1932, June, 504; ²*Practitioner*, 1932, June, 569; ³*Presse méd.* 1931, Sept., 1398; ⁴*Amer. Jour. Med. Sci.* 1931, July, 43; ⁵*Brit. Med. Jour.* 1931, ii, 1032; ⁶*Ann. of Surg.* 1931, July, 157; ⁷*Jour. Amer. Med. Assoc.* 1931, Nov., 1597; ⁸*Bull. et Mém. Soc. nat. de Chir.* 1932, May, 722; ⁹*Arch. f. klin. Chir.* 1932, Jan., 113; ¹⁰*Jour. Amer. Med. Assoc.* 1931, Dec., 1785; ¹¹*Ann. of Surg.* 1931, Dec., 1018.

ACHLORHYDRIA.*Robert Hutchison, M.D., F.R.C.P.*

This condition and its associations have been attracting a good deal of attention recently. Unfortunately, however, some of the literature on the subject has been confused by a failure to distinguish clearly between achlorhydria (absence of free hydrochloric acid in the gastric contents) and achylia (absence of acid and ferments). It is necessary, too—and this has often been forgotten—to know the frequency of achlorhydria in normal persons before attempting to assess its importance in disease. F. R. Vanzant¹ and some of his colleagues at the Mayo Clinic supply information on the latter point by a study of the gastric secretion in over 3000 patients who had no signs of symptoms of disorder of the alimentary system. They found, as others have done before them, that there is a steady increase in the incidence of achlorhydria from youth to old age. At the age of 60, 28 per cent of women and 23 per cent of men failed to show free acid on repeated fractional analysis. In an additional 5 per cent of women and 3 per cent of men there was no free acid in the Ewald meal at the end of an hour. Free acid appears to increase rapidly from childhood up to the age of 20, when adult values are reached. About the age of puberty the average value for boys begins to rise considerably above that for girls. 'Modal' free acidity for men ranges between 45 and 50 units in the years from 20 to 40; after this it falls off rapidly to a level of from 30 to 35 units in the aged. In women the figure is about 35 units throughout adult life.

Stanley J. Hartfall,² in a review of about 2500 gastric analyses made during the past ten years at New Lodge Clinic, most of them in patients suffering from gastro-intestinal affections, found 13·7 per cent with achlorhydria. He also finds the condition commoner in females (16·3 per cent as compared with 11·5 per cent) especially after the age of 40, but amongst males he found no evidence of increasing anacidity with age, in this point differing from Vanzant's observations.

W. Scott Pollard and A. L. Bloomfield³ examined the gastric secretion in 500 patients with and without digestive symptoms. They concluded that 'unexplained' achlorhydria will be met with in from 3 to 5 per cent of the patients in a medical clinic, but as they add that the 'disorder' was distinctly one of middle and old age it may be guessed that they were simply dealing with the normal decline in acidity which occurs in later life and which is now well recognized.

ETIOLOGY.—As I. J. Jarvis Nye and C. H. Sippe⁴ point out, achlorhydria may be brought about in several ways:—

1. Excessive neutralization of free acid occurs in the stomach by abnormal regurgitation of duodenal contents or by excessive saliva or mucus, all of which are alkaline in reaction.

2. Mechanical blockage to free secretion occurs. For example, the excessive mucus which is found in mucous gastritis may block the tiny outlets of the glands and prevent the acid from flowing into the stomach lumen. Types of food or medication may act in a similar manner—for example, excessive fat, cod-liver oil, liquid paraffin, etc.

3. Deficient secretion of acid is brought about by: (a) Pathological defects. Faber, by his studies, has shown that the gastric parenchyma reacts towards bacterial toxins in the same way as do other glandular organs—that is, they set up a disease of the glandular parenchyma of an inflammatory nature. This condition, which is a true gastritis, results in complete atrophy of the secreting cells. (b) Conservative effect. The blood may have deficient acid-forming material available, all the acid ions being required to maintain the acid-base equilibrium, and therefore a portion of the chloride ions is secreted

as neutral chlorides. (c) Nervous suppression may be brought about by psychical influences in general or of the test meal in particular.

It must also be recognized that achlorhydria may occur as a constitutional and perhaps inherited peculiarity. The tendency at present is, following Faber, to regard acquired achlorhydria as most often due to a chronic gastritis set up not only by local irritants, e.g., alcohol, but also by blood-borne agents. This view is supported by E. L. Eggleston,⁶ but, as Vanzant points out, this will not explain the gradual decline in acidity with advancing age.

ASSOCIATED CONDITIONS.—Pernicious anæmia and gastric carcinoma have long been known to be associated with achlorhydria, but in addition it is often met with in some wasting diseases (pulmonary tuberculosis, diabetes, hyperthyroidism, etc.), in asthma, chronic arthritis, and biliary infection; and also in some functional conditions, such as 'nervous exhaustion'. Nye and Sippe describe a syndrome the main features of which, in addition to achlorhydria, are anæmia, lassitude, constipation, dry tongue, dry skin, and cold intolerance. They call it the 'cold intolerance achlorhydria syndrome'.

H. Moore⁶ first described the now well-known association of achlorhydria with a hypochromic, non-megaloeytic anæmia and some degree of glossitis met with in middle-aged women and curable by massive doses of iron.

T. H. Oliver,⁷ in a paper entitled "The Achlorhydric Syndrome," founded upon 100 cases, recognizes the following groups: (1) Gastro-enterogenous, in which symptoms referable to the alimentary tract, especially gastrogenous diarrhoea, are most prominent; (2) Sore tongue, a glossitis with sometimes ulcers on the lips and gums; (3) Dermatoses such as urticaria or dermatitis herpetiformis; (4) Secondary anæmia (as described by Moore); (5) Rheumatoid arthritis. These different associated manifestations may occur alone or in combination. The question is, what is the relation of the achlorhydria to these different associated manifestations? Is it a cause or a consequence of them? The tendency amongst writers on the subject seems to be to adopt the former view, and Hurst, Apperly,⁸ and others consider even the achlorhydria of gastric carcinoma as a precedent to the disease, whilst as regards anæmia it would seem that the achlorhydria cannot be the consequence of the latter as it persists even after the blood has been restored to normal. There are some grounds, however, for the belief that in conditions of lowered vitality an economy in the production of gastric juice is effected and this may explain the occurrence of achlorhydria in cases of wasting disease in so far as such an occurrence is not merely an expression of the natural diminished acidity met with in later life. One's impression is, indeed, that the importance of achlorhydria tends to be exaggerated at the moment.

SYMPTOMS.—Achlorhydria probably does not in itself often produce any symptoms, but in a few cases it is associated with flatulent dyspepsia. Its responsibility for the production of gastrogenous diarrhoea also seems undoubted, though this symptom only occurs in a small minority of cases. How achlorhydria causes diarrhoea is unknown. Hartfall has shown that the accepted explanations of gastric hurry or increased intestinal putrefaction are untenable. Gastric hurry often occurs without diarrhoea, and in gastrogenous diarrhoea no increased intestinal putrefaction can be demonstrated.

TREATMENT.—None as a rule is necessary, but in the diarrhoea cases **Hydrochloric Acid** by the mouth rapidly effects a cure. Large doses are not really necessary. In cases due to gastritis **Lavage of the Stomach with Peroxide of Hydrogen** may restore the secretion.

REFERENCES.—¹ *Arch. of Internal Med.* 1932, March, 345; ² *Guy's Hosp. Rep.* 1932, Jan., 13; ³ *Arch. of Internal Med.* 1931, Sept. 412; ⁴ *Med. Jour. of Australia*, 1932, Feb. 6, 189; ⁵ *Jour. Amer. Med. Assoc.* 1931, Oct. 24, 1216; ⁶ *Brit. Med. Jour.* 1932, i, 363; ⁷ *Clinical Jour.* 1931, Sept. 23, 445; ⁸ *Med. Jour. of Australia*, 1932, Feb. 20, 260.

ADRENAL GLANDS, DISEASES OF.

W. Langdon Brown, M.D., F.R.C.P.

ADDISON'S DISEASE.

C. H. Rowntree and others¹ divide the clinical course of Addison's disease into three stages: (1) The initial destruction of the gland; (2) The recognizable clinical syndrome; and (3) The terminal stage or crisis. The administration of the **Cortical Hormone** allays nausea and vomiting in the crisis and therefore greatly facilitates the ingestion of sufficient fluid, thereby relieving anhydremia and consequent renal insufficiency, thus prolonging life. In conjunction with some of the same workers Rowntree² records twenty cases of Addison's disease (some of which have been previously reported) and maintains that the experimental phase in the clinical use of the cortical hormone has now been completed, and that when this hormone made according to Swingle and Pfiffner's method can be prepared on a commercial scale, a new and organotherapeutic agent will be in our hands. H. W. Benham and others,³ however, report 3 fatal cases of Addison's disease in spite of intravenous injection of cortical hormone, although 2 showed a marked temporary improvements. Toxic effects following the injections they attribute to the trace of protein contained in them. They advise a preliminary dose of $\frac{1}{2}$ to 1 c.c. to test for individual susceptibility to it; in the absence of any rise of temperature the ordinary doses of 5 to 10 c.c. twice daily could then be given. If there is a relapse the injections should be resumed without waiting for any serious symptoms to occur.

Levy Simpson⁴ details 6 typical cases of Addison's disease treated by cortical hormone. He recommends 50 c.c. to be given on the first day in a crisis, and 20 c.c. subsequently, reducing the dose by stages to a maintenance dose of 5 c.c. He advises the intravenous route in all severe cases during the first week, the intramuscular or subcutaneous route being used later. All his 6 cases benefited, though 3 subsequently died from various complications. He noted a fairly persistently low blood-sugar, and suggests that adrenalin may be a factor in regulating this. A low gastric acidity or complete achlorhydria was frequently met with. Like others, he has found radiology valuable in confirming the diagnosis. On this last point, R. E. Ball and others⁵ also report cases. They regard calcification here, as in the lungs, as evidence of an attempt at healing, and therefore of encouraging prognosis.

F. A. Hartman et al.⁶ speak well of the effects of treatment of Addison's disease by cortical extracts, while G. A. Harrop et al.⁷ are more cautious, finding the best results when treatment is instituted before severe damage has occurred. They do not regard it as a substitution therapy in the sense that insulin is.

ADRENAL VIRILISM.

Attention has repeatedly been called in recent volumes of the **MEDICAL ANNUAL** to the close resemblance between the virilism due to basophilic tumours of the anterior pituitary and tumours of the adrenal cortex. The interest excited by Cushing's description of his pituitary syndrome has tended to divert attention from the adrenals as a factor in virilism. L. R. Broster and H. Gardiner-Hill⁸ report 3 instances of this successfully treated by unilateral **Adrenalectomy** where one of these organs showed definite hyperplasia, without any neoplasm. They recommend laparotomy to determine on which side enlargement exists, and then removal of the enlarged organ by a posterior trans-thoracic operation. The reviewer has had one such case recently in which, however, the laparotomy revealed the fact that the

hyperplasia was bilateral. J. R. Charles⁹ reports and illustrates (*Plates I, II*) a case in which removal of an enlarged left adrenal led to marked improvement. It has been suggested that this was a case of Cushing's syndrome. The combination of a pituitary basophilic adenoma with adrenal cortical hyperplasia may certainly exist, but the improvement in this case shows that the adrenal factor was an important one. J. A. Birrell¹⁰ reports a fatal case of virilism with sexual precocity in a girl of 5 associated with a malignant tumour of the left adrenal gland.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1932, Jan., 1; ²*Jour. Amer. Med. Assoc.* 1931, Nov. 14, 1446; ³*Lancet*, 1932, i, 125; ⁴*Quart. Jour. Med.* 1932, Jan., 99; ⁵*Jour. Amer. Med. Assoc.* 1932, March 19, 954; ⁶*Ibid.* March 5, 788; ⁷*Ibid.* April 30, 1625; ⁸*Brit. Jour. Surg.* 1932, April, 557; ⁹*Bristol Med.-Chir. Jour.* 1932, 115; ¹⁰*Ibid.* 119.

ADRENAL GLANDS, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Calcification in Tuberculosis of the Adrenal Glands.—Tuberculous adrenals often show areas of calcification upon X-ray examination. R. C. Ball¹ records six cases of Addison's disease with demonstrable shadows in the region of the adrenal glands. Suspected cases of Addison's disease should always be examined radiologically. These shadows are of obvious interest and importance from the point of view of differential diagnosis.

Adrenal Cortical Hyperplasia.—Hyperplasia of the adrenal cortex in the female results in an 'adreno-genital syndrome', of which there are three types: (1) Adrenal pseudo-hermaphroditism; (2) Adrenal virilism or hirsutism (*Plate III, A*); (3) The Achar-Thiers syndrome—diabetes in fat, bearded women (*Plate III, B*). L. R. Broster et al.² report the result of **Unilateral Adrenalectomy** in an example of each type. In 'Type 2 (hirsutism)', the loss of one adrenal benefited the patient considerably, but in adrenal pseudo-hermaphroditism and in the Achar-Thiers type no change was registered. Unilateral adrenalectomy was well tolerated by all three patients; there were no untoward post-operative symptoms. It is especially interesting to note that the blood-pressure did not vary during or after any of the operations.

Carcinoma of the Adrenal.—Adrenal virilism also occurs in cases of adrenal neoplasms, which are usually of a very malignant nature. J. Meyer and G. Frundas³ describe a case of carcinoma of the adrenal in a girl of 13. The patient exhibited an abnormal growth of pubic hair of masculine distribution. Widespread secondary deposits occurred rapidly.

Paraganglioma of the Adrenals.—Paraganglioma of the adrenals is composed almost entirely of chromaffin cells of the medulla. It is usually benign and occurs only in adults. J. A. Lazarus and A. A. Isenberg⁴ record two cases, both in women of 58 years of age. L. E. C. Norbury⁵ successfully removed a tumour of the adrenal weighing 11½ lb. from a woman aged 54. The growth was adherent to the kidney and the spleen, and it was found necessary to remove the latter with the tumour. Pre-operative and post-operative blood transfusions were given.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, March 19, 951; ²*Brit. Jour. Surg.* 1932, April, 557; ³*Arch. of Internal Med.* 1931, xlviii, 611; ⁴*Jour. of Urol.* 1932, xxvii, 1; ⁵*Trans. Med. Soc. Lond.* 1932, lv, 107.

AGRANULOCYTOSIS (Agranulocytic Angina).

Stanley Davidson, M.D., F.R.C.P.E.

A. E. Taussig and P. C. Schnoebelen¹ review the literature on agranulocytosis, and find that 330 cases have been reported. The sex incidence was twice as common in females as in males. In analysing the results of therapeutic measures it was found that the cases treated by means of **Irradiation** had a mortality of 53 per cent, by means of **Transfusion** 64 per cent, while other

methods had a mortality rate of 75 per cent. Accordingly they suggest a combination of transfusion and irradiation of the skeleton with one-twentieth of a skin dose.

H. M. Conner et al.² report 14 cases in which the outstanding features were leucopenia and partial disappearance of the granular leucocytes (hypogranulocytosis), or complete disappearance of them (agranulocytosis). In some cases agranulocytic angina was definitely present. The authors believe that the terms 'agranulocytosis' and 'hypogranulocytosis' do not indicate entities, but probably stand for types of reaction of the leucopoietic apparatus to various types of infection or intoxication. [This was the view expressed by the reviewer last year in the MEDICAL ANNUAL, p. 14.] Death occurred in 10 of their cases.

H. Jackson, F. Parker, J. F. Reinhart, and F. H. L. Taylor³ describe 20 cases of malignant neutropenia (agranulocytosis) of varied etiology which have been treated with intramuscular and intravenous injections of **Nucleotides**. In 14 of these cases recovery took place. Clinical and hæmatological improvement was claimed to have occurred quite consistently about the fifth day after treatment was begun.

REFERENCES.—¹*Jour. Amer. Med. Assoc.*, 1931, Dec. 12, 1757; ²*Arch. of Internal Med.*, 1932, Jan., 123; ³*Jour. Amer. Med. Assoc.*, 1931, Nov. 14, 1436.

AIR-PASSAGES, UPPER, AND POST-CRICOID REGION, MALIGNANT DISEASE OF.

F. W. Walkyn-Thomas, F.R.C.S.

Douglas Harmer,¹ who confines his paper to the *upper airways*, and excludes post-cricoid carcinoma as being really an œsophageal condition, deals fully with the methods and results of **Radiotherapy** either by X rays or radium. He emphasizes the importance of early treatment. As he points out, most ulcers and tumours of these regions are malignant, and the condition should never be regarded as benign because no enlarged glands can be found. No patient with cancer should ever be put on the 'waiting-list', and minor operations only aggravate and disseminate the growth.

Although he regards biopsy as essential in most cases, he holds that in a doubtful case it is wiser to rely on the clinical appearances rather than on the section. As many growths are so active that it is dangerous to cut them with the knife, the piece for section, which the pathologist usually demands must be cut from the growing edge, should not be removed until ray treatment has started or is ready to be started.

X rays are used on the principle of converging fire, so that the areas of irradiation overlap. Radium may be used either at a distance from the skin surface, on the surface, or 'interstitially'—that is to say, buried near the growth. To get the maximum effect the radium should be used at the shortest possible range, and the barrage must cover the whole of the growth. Harmer believes that it is better to use needles than 'seeds', and that it is better to apply the needles around the growth rather than to embed them in it. Throughout the paper he lays stress on the importance of avoiding damage to the surface of the growth. Small doses over a long period give better results than large doses over a short period, and the effect can be still further increased by 'split doses', i.e., a series of exposures at short time intervals. Radium burns are more often due to inadequate filtration than to overdosing; such 'burns' may appear years after treatment, and are then probably due to an endarteritis obliterans produced during treatment. It is generally agreed that repetition of radiation treatment is inadvisable.

Harmer's views on treatment in different regions and of different varieties of growth may be summarized as follows :—

1. *The Larynx*.—Harmer strongly supports radium treatment here. Even in cases suitable for laryngo-fissure he does not consider it necessary to remove a growth by surgery; up to date his results are as good as those obtained by operation, and the voice is usually unaffected. He removes an adequate amount of the laryngeal cartilage without damaging the intralaryngeal structures, and applies the radium in the space so made. For more extensive growths a preliminary X-ray treatment is given. In cases that could usually only be treated by laryngectomy pre- and post-operative surface radiation is combined with buried radium.

2. *The Hypopharynx*.—The results of radium treatment have been discouraging with regard to ultimate cure, but have given considerable relief. Harmer advises exposure of the pharynx and application of needles to the unopened wall.

3. *The Nose*.—

a. *Surface growths, rodent ulcers, etc.*: Radium acts more quickly than X rays, and for growths resistant to rays diathermy is preferable to surgical excision.

b. *Sinuses*: Surgery alone gives poor results. Preliminary treatment with X rays is advised, followed by removal of the palate and alveolar margin on the affected side, removal of the growth by diathermy, and insertion of radium. Round- and spindle-celled sarcomata are best treated by X rays and surface radium.

4. *Nasopharynx*.—Intense X rays with radium applied locally.

5. *Tonsil and Mesopharynx*.—

a. *Carcinoma*: Needling of the growth with radium, followed by diathermy excision of remaining indurations, surface radiation of the neck, and buried needles in the glands. If 'block dissection' is undertaken—and that should be seldom—needles should be left in the wound.

b. *Sarcoma*: Massive X rays, with radium if there is failure to respond.

6. *Palate and Cheek*.—Very early and low-grade growths may be excised by diathermy. Otherwise X rays and heavily screened radium on a denture or by insertion of needles. Leukoplakia should be treated by diathermy rather than by radium. Early and thorough treatment of glands.

7. *Endotheliomata*.—Pre-operative X rays. Surgical removal of the growth, diathermy to base of attachment, and buried radium.

8. *Transitional-cell Carcinomata and Lympho-epitheliomata*.—No surgery. X rays, and radium locally if the X rays fail.

In conclusion Harmer remarks that the apparently poor results obtained by radium in carcinomata are accounted for by the fact that many of his cases were inoperable, that all cases treated have been included, and that many cases treated could not be traced.

Surgeons should not use radium without the advice of experts; and, on the other hand, patients should not be handed over for treatment to the pure radiotherapist.

C. von Eicken,² writing on *malignant disease of the hypopharynx*, is in general agreement with Harmer. He is opposed to surgical intervention on the whole; for although in some cases where the growth is limited to the lateral wall of the larynx laryngectomy may effect a cure, in cases where the sinus pyriformis or the deeper parts are attacked the most formidable and mutilating operations give little hope of permanent cure. External applications of a 'radium pack' are sometimes used as a preliminary to surgery. The area of the tumour on the pharyngeal wall is then exposed without opening the pharynx, and radium is applied. The vessels are protected by thin rubber sheeting, and the wound is completely closed. Speaking of X rays, von Eicken

remarks that if Coutard's 'fractional' method justifies the claims made for it, it opens up a more hopeful outlook.

J. J. Duffy³ reviews 122 cases of *carcinoma of the tonsil* treated between 1917 and 1920. He believes that surgery alone is incapable of coping adequately with the disease. Surgery has its place in dealing with some glandular metastases, but for treatment of the primary growth he relies on radon implantation and a radium pack, with high-voltage X rays. Of 49 cases treated up to the end of 1925, 10 are now alive and free of disease. He gives no figures for cases treated since then, as he holds that they are too recent to give reliable results.

Gordon New, A. C. Broders, and J. H. Childrey⁴ discuss the *highly malignant tumours of the pharynx and base of the tongue*. The most common, in 624 cases seen at the Mayo Clinic in fourteen years, were lymphosarcomata and highly malignant endotheliomata. Most of the cases treated were treated by irradiation, but in some cases this was supplemented by surgery and diathermy. In all, 182 cases were treated. Death was usually due to local extension of the malignant process, not to metastases.

Wilfred Trotter⁵ shows that in *growths of the hypopharynx* "**Local Excision** by the knife has a definite usefulness". In many cases there is no need for any mutilating operation; in fact, he says that he "should not feel able to record as a true success the cure of a pharyngeal carcinoma won at the expense of a laryngectomy". He believes that owing to the technical ease with which a formal laryngectomy can be done there is a tendency to use this method for small juxtalaryngeal growths of the pharynx which could be treated by pharyngotomy and local excision. In growths on the lateral laryngeal wall the whole growth can sometimes be successfully removed by transhyoid pharyngotomy without any damage to the larynx, and the same is true of some post-cricoid growths. Except in post-cricoid growths Trotter believes that the gravity of glandular invasion has been exaggerated.

In Trotter's opinion "one of the most beneficial effects of the introduction of radiotherapy has been its tendency to make us look with increasingly critical eyes at treatment by crudely mutilating operations". Although radium has given us a new and powerful weapon for our attack it has not simplified the attack. It has made the attack more dependent than ever on expert judgement. Up to the present the total end-results may actually have been made worse by the introduction of radium, for patients who would have had a good chance of cure by operation have had that chance wasted by ineffective radium treatment. Further experience will ensure the full benefits of radium treatment and this danger will be eliminated, but so far "it must be insisted on that radium has brought about no notable simplification in the treatment of pharyngeal growths".

Georges Portmann⁶ remarks on the tendency in France to regard any *carcinoma of the post-cricoid region or of the sinus pyriformis* as beyond the reach of surgery, and points out the advantages of **Pharyngotomy** for excision of the growth or for easier application of X rays or radium. He performs Trotter's operation as modified by Colledge, under general anaesthesia with preliminary tracheotomy.

L. Colledge and Peacock⁷ believe that "in the *larynx and lower pharynx* radiation has failed to establish itself", and that here radium should be used only in exceptional cases. For the *jaw and nasopharynx* probably the future lies with radiation. Their views are supported by a series of 126 cases treated over a period of ten years, mostly by surgery alone.

A. J. Tapia⁸ up to October, 1920, has performed 190 laryngectomies with 6 per cent operative mortality and 35 per cent recurrences. He uses radium when the patient refuses operation, in inoperable cases, and as an adjunct to

surgery. In early cases he used laryngofissure, hemilaryngeotomy, and an operation known as 'anterior hemilaryngeotomy', which he describes.

[It will be seen that, although there is now good reason to hope for further improvement in the results of treatment by radium and deep X rays, these methods have not yet excelled the results of surgery in the treatment of cancer in these regions. This is specially true of the larynx and the orifice of the œsophagus. In the nose, nasopharynx, and tonsil the weight of opinion is inclining towards ray treatment in preference to surgery.—F. W. W.-T.]

REFERENCES.—¹*The Semon Lecture*, 1931; ²*Jour. Laryngol. and Otol.* 1932, xlvii, 229; ³*Surg. Gynecol. and Obst.* 1932, March, 539; ⁴*Ibid.* Feb., 164; *Arch. Otolaryngol.* 1931, xiv, 596, 699, 713; ⁵*Lancet*, 1931, ii, 833; *Proc. Roy. Soc. Med.* 1932, 431; ⁶*Presse méd.* 1931, 1885; ⁷*Jour. Laryngol. and Otol.* 1932, xlvii, 161; ⁸*Zentralb. f. Hals*, 1932, xviii, 75.

ALBUMINURIA. (See RENAL DISEASE.)

ALCOHOL AND DRUG ADDICTION. (See also TOXICOLOGY—POISONING BY METHYL. ALCOHOL.)

H. Devine, M.D., F.R.C.P.

Alcoholism.—In an article on *alcoholic craving* Alex Baldie¹ observes that no treatment of chronic alcoholism can be effective which does not include a deliberate attempt to strengthen the will of the patient to discard the drug and to understand and undermine the potency of the craving which is his besetting vice. This part of the treatment is difficult and complex, since it must be approached on special therapeutic lines, and here, by his intimate knowledge of the patient, the family doctor may be very helpful. Further methods of relief are the following: (1) The craving may be related in part to the established and specialized influence on metabolism which alcohol possesses. To this extent its replacement by other forms of fuel, such as sugar, may be of use. (2) The unrelieved overactivity of the higher mental faculties, from the strain of which alcohol has provided an habitual escape, must be avoided and another escape discovered—in other words, fresh emotional outlooks must be cultivated. (3) The alternations of low and high blood-pressure induced by the alcoholic transformation must be borne in mind. Generally depression goes with a low blood-pressure; high-spirited optimism with a high. It is in its effects in this direction that exercise and occupation, not fatiguing and preferably of some useful and interesting kind, is indicated. (4) The important influence of the repetitive and automatic nature of the drinking ritual requires attention. The mental preliminaries to 'another little drink' may be active against the conscious will and knowledge of the patient, who must be alert to understand his unconscious tendencies and to break the repetitive chain. 'Substitution' activities may be objectionable, but may help. (5) Misinterpretation of simple thirst will be avoided if the patient assuages his natural thirst periodically with small doses of aqua pura. Misinterpretation of fatigue will be prevented by periodic rest.

Baldie outlines the *factors which lead to the diminution of alcohol drinking* as follows: (1) Lessened popularity; (2) The heavy and prohibitive taxation of alcoholic beverages and other restrictions; (3) Shorter hours of work and the higher standard of living now enjoyed by that section of the public from which the statistics of old-time police-court drunkenness were drawn; (4) Increased facilities for young persons for games and adventure; (5) A loosening of conventional restraint between the sexes; (6) The extension of education and of knowledge concerning the disadvantages of alcoholic excess. The factors which combine to *increase* alcoholism of a morbid degree are summarized as follows: (1) Group pessimism and restlessness, due to insecurity caused by economic difficulties and the disturbance of social and moral outlook; (2) Encouragement of habits of secrecy and excess through indulgence according

to opportunity rather than to necessity, caused by the restriction of hours and places in which alcohol may be openly sold and consumed; (3) The relatively large increase in drinking among women, consequent upon the greater independence exercised by the sex; (4) The absence of amenities such as music and dancing, and of facilities for the use of alcohol socially, in public and with meals, such as abound in other countries; (5) The increasing organization of local transport and movement in the body social and economic, without adequate provision for physiological rest and privacy for the individual; (6) The inability of most persons to relax at will; (7) The biological necessity for play and other escapes from reality, and the inadequacy of modern life to provide such escapes; (8) The social, moral, and political antagonisms which are produced by all biological deprivations compulsorily applied, reasonably or unreasonably, by the group to its members.

A lecture by Viscount Brentford² on *how the alcohol question concerns the duties of the Home Office* includes a number of interesting observations from the medical point of view. Particularly is this the case in his outline of views held on the question of the effect of alcoholism in the parents on the unborn child. Reference is made to medical views expressed at the Royal Commission appointed a few years ago to explore the alcohol problem from all points of view. The views expressed are thus summarized: (1) There may be, and probably is, some impairment of the reproductive cells of the parent caused by an excessive consumption of alcohol; (2) Chronic alcoholism is at least a possible cause of sterility in both men and women; (3) Infant mortality amongst the children of alcoholic parents is higher than in the case of parents who do not so indulge; (4) Small quantities of alcohol taken by a woman in pregnancy enter through her blood into the blood of her child, and have an adverse influence upon development.

This problem is also discussed by W. N. East³ in a paper dealing with *mental defectiveness and alcohol and drug addiction*. He takes the view that, on the whole, parental alcoholism appears to be a less important factor in the production of inherent defect than some have supposed, but if added to other causes may determine the event. Dr. East brings some interesting statistics which show that the general impression that mental defectives tend as a class to become alcoholics is not justified by facts. He made an analysis of 698 mentally defective persons who had been convicted of various offences during the ten-year period 1921-30, and were subsequently certified in prison to be defective within the definition of the Mental Deficiency Acts. Of these, only 53, or 7.4 per cent of the whole, were or had been convicted of drunkenness. Only 4.1 per cent of the cases under the age of twenty-five were associated with drunkenness, and 18 per cent of those over that age—a very different estimate from the 60 and 70 per cent of past estimates. Other figures from various sources are given which clearly show that the incidence of alcoholism among defectives who are now detained in institutions is negligible.

Alcohol in Therapeutics.—In his Annual Report to the London County Council, J. D. Rolleston⁴ once more emphasizes his opinion that alcohol is still used in hospitals from the therapeutic point of view as a 'stimulant' under what he believes is a mistaken point of view. Since 1926 Rolleston has endeavoured to reduce the consumption in the Western Fever Hospital, and at the time of publication of his report no alcohol has been used either in the hospital or in the ambulance connected therewith for over three years. Comparison of the case-mortality of the principal diseases at the Western Hospital during the last three years, in which little or no alcohol was used, with that of the nine acute fever hospitals of the Council, shows that, with the exception of scarlet fever, in which there was a difference of only a decimal in

1928, and of diphtheria in 1930, the Western Hospital was below the average. It is interesting to note that since Jan. 1, 1927, strict control has been kept over the use of alcohol in the ambulance service connected with the hospital. The nurses, indeed, are so convinced of its being unnecessary, that no brandy or any other form of alcohol has been used in connection with the Western Hospital since May, 1928, when two drachms were given to a small-pox patient. (See also PHARMACOLOGY AND THERAPEUTICS—ALCOHOL.)

Diagnosis of Drunkenness from the Excretion of Alcohol.—In the MEDICAL ANNUAL of 1929 (p. 12) attention was drawn to the researches of E. Bogen, which led to the view that the alcoholic concentration of the urine, breath, or spinal fluid is the most reliable single factor in arriving at a correct conclusion as to the degree of intoxication of a patient. S. Smith and C. P. Stewart⁵ now report similar investigations as a test for drunkenness which do not support the use of this method of diagnosis. Clearly the matter is one of considerable importance, and for this reason it would seem desirable to reproduce in full the conclusions reached by these investigators. These are thus summarized: "As to the diagnosis of alcoholic intoxication, our results do not support the idea that estimation of the concentration of alcohol in either breath or urine is a valuable aid to diagnosis. Obviously, with very high concentrations such as 0.4 to 0.5 per cent there is no doubt as to the diagnosis, but in these cases the circumstances are such that even without the analysis of urine there is no difficulty. Carter takes 0.2 per cent as the dividing line above which a diagnosis of drunkenness is justified, and similar standards are set up by others, but to us this appears a very dangerous procedure. We have met a case of undoubted drunkenness—a semi-comatose condition—in which the concentration in the urine never reached this level, and that in an almost teetotal subject who drank 250 c.c. of whiskey. Though this does not constitute a serious indictment of the validity of the method of diagnosis, since it is only claimed that a man showing over 0.2 per cent of alcohol in the urine is drunk, and not that one showing less than this is sober, other of our results invalidate the test. For in certain of our experiments the subjects were classed as sober by the police surgeon and showed no evidence of being affected by alcohol when tested by psychological methods, but were nevertheless excreting urine containing more than 0.2 per cent of alcohol. Hence, with a urinary alcohol concentration of about this figure, the diagnosis is extremely doubtful; and yet it is here, near the borderline between drunkenness and sobriety, that the test would be most useful. We are forced to the conclusion, therefore, that as a means of diagnosis of drunkenness urine analysis is valueless, though as a means of determining the minimum amount of alcohol consumed, it may on occasion prove useful."

Drug Addiction.—A. G. Biggam, N. A. Arafa, and A. F. Ragab⁶ write on *heroin addiction in Egypt* and its treatment during the withdrawal period. A group of 120 cases were investigated. Heroin is much the most prevalent drug of addiction in Egypt, the habit seldom resulting from its administration for medicinal purposes, but usually from its repeated employment as an aphrodisiac. The habit, once established, necessitates the continuation of the drug long after all sexual effects have ceased. Addiction to heroin affects much more the psychic than the physical state of the individual, all the higher faculties being impaired, self-control diminished, and the addict becoming a mental and moral invalid. As regards treatment, the withdrawal symptoms were always most marked during the first three or four days, and were influenced greatly by the mental attitude to, and his faith or otherwise in, the treatment. Some individuals had no real desire to stop the drug, while others were determined at all costs to do so. Experiments with so-called 'cures'—

autohæmotherapy, autoserotherapy, and insulin—failed to show any resultant benefit to the addict during the withdrawal period or subsequently.

In the treatment of these cases the writers found a special **Substitution Therapy** to be most helpful, heroin being stopped at once and sedative drugs given to alleviate the withdrawal symptoms. Under this line of treatment the patient can be kept comfortable and almost free from symptoms during the breaking-off period. Under this régime the sedative drugs morphia, luminal, intramuscular magnesium sulphate, and paraldehyde are gradually reduced, and the patient finishes all drug treatment by the end of the seventh day. No signs of any toxic effect were observed in this substitution method of treatment, but no beneficial effect on the tendency to relapse appeared to result.

Those who are interested in the drug addiction problem will find papers on *drug addiction as a national problem* by Sir M. Delevinge⁷ and T. W. Russell Pasha⁸ most interesting and informing. A useful summary of medical opinion on the *cigarette habit* is given by J. D. Rolleston.⁹

Abstinence Symptoms from Atropine.—R. Flinker¹⁰ points out that abstinence symptoms in morphia, cocaine, alcohol, nicotine, and even chloral hydrate have been fully described, but that the symptoms exhibited in abstinence from atropine have scarcely been noticed. That such symptoms may occur is now being recognized. We have certainly learned recently that the encephalitic patient is peculiarly tolerant to atropine, and to treat them with large doses of the drug. While the maximum doses of atropine sulphate (1 mgrm. t.d.s.) were formerly seldom exceeded in a prolonged period, now greatly increased doses are given. Thus 20 mgrm. of atropine sulphate is nothing exceptional as a daily dose. It is thus not to be wondered at that cessation of the drug produces a different result from that of former doses. Kleeman has stated that the omission of the drug brings little or no accompanying symptoms, but with longer abstinence, giddiness, sickness, and other symptoms are liable to set in. Unfortunately he does not state what doses were given; they are described as 'not too high,' but may have overstepped the maximum dose. It is questionable if the symptoms described some time after the drug was discontinued could be regarded as abstinence symptoms. Flinker himself, however, briefly describes cases which show clearly the characteristics of withdrawal reactions. The following example will serve to illustrate the symptoms exhibited:—

Male, 'grippe with somnolence'. Since 1929, tremor of extremities, stiffness, Parkinsonian facies. On June 5, 1931, the patient came under treatment. He then received daily one drop of $\frac{1}{2}$ per cent solution of atropine sulphate. With cautious increases he was taking by Aug. 7 $13\frac{1}{2}$ mgrm. of the drug per day. Toxic appearances did not occur during this period. The patient merely complained of dryness in the throat; the pupils were dilated and reacted sluggishly to light and accommodation, and the pulse was normal. On Aug. 7 at 9.30 a.m. the last dose of atropine sulphate ($13\frac{1}{2}$ mgrm.) was administered. The patient was free of complaints during the day. At 10 p.m., however, salivation began, which increased during the night. With this soon came vomiting and retching, together with giddiness. The next morning came strong outbreaks of sweating. These symptoms increased during the day. In the evening the patient received 0.06 gm. of extract of belladonna, with the result that a decided improvement took place. The retching ceased, and the sickness and giddiness diminished. On the morning of Aug. 9, the patient received 18 drops of his usual atropine solution and after a few minutes he felt better; in half an hour all deprivation symptoms had ceased.

J. McDougal¹¹ records a fatal case of *paraldehyde poisoning*, with post-mortem findings. The subject was a woman, aged 44, who drank about 4 oz. of pure paraldehyde. This resulted in a state of profound coma, with sub-normal temperature. Her breath 'smelt strongly of paraldehyde, and the washings from the stomach also smelt strongly of the drug. Knee-jerks were

absent and corneal reflexes abolished. As a result of treatment (rectal salines, warm bottles, oxygen inhalation, and strychnine injections) she improved; the swallowing reflex and conjunctival reflex returned. The temperature rose to 105°. Twenty ounces of urine were drawn off. Later she collapsed, and the pulse became thready, and eventually disappeared at the wrist. The respiratory rate increased to 30 a minute, and she died approximately fifty hours after the fatal dose.

REFERENCES.—¹*Lancet*, 1931, ii, 434; ²*Brit. Jour. Inebriety*, 1932, Jan., 108; ³*Ibid.* April, 149; ⁴*L.C.C. Annual Report*, 1930, Vol. IV (Part III), Med. Supplement to Report on Hospital Services, 1932; ⁵*Brit. Med. Jour.* 1932, i, 87; ⁶*Lancet*, 1932, i, 922; ⁷*Brit. Jour. Inebriety*, 1931, Oct., 54; ⁸*Ibid.* 60; ⁹*Ibid.* 1932, July, 1; ¹⁰*Munch. med. Woch.* 1932, April 1, 540; ¹¹*Jour. of Ment. Sci.* 1932, April, 374.

ALLERGY, FOOD. (See FOOD ALLERGY.)

AMOEBIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

E. C. Faust¹ reports further on the dog as a good experimental host for *E. histolytica*. Positive results were obtained in 93 per cent of 65 animals inoculated with active forms of canine strains by pressure through the rectum so as to pass up into the lower part of the ileum, and in 65 per cent of 20 dogs inoculated with human strains. No clinical or pathological differences were found between the two strains, and the effects produced varied from acute through chronic infections to latent carriers, but amœbic hepatitis was never observed. The incubation period averaged 8.4 days with the canine, and 3.6 days with the human, strain. Feeding the infected animals with liver or liver products and with cod-liver oil appeared to have a very good effect on the progress of the disease.

A good clinical account of amœbiasis from the notes of the late W. E. Musgrave, edited by A. C. Reed,² has been published.

M. J. Hogue³ has tested the effects of four amœbicidal drugs on tissue cultures of the digestive tract, from which he concludes that in dilutions of 1-1000 dihydranol kills tissue cultures at once; emetine hydrochloride does so in twenty-four hours; yatren kills most of the cells in the same time; but the de Rivas' solution, consisting of equal parts of glycerin and of a 30 per cent solution of magnesium sulphate, is not very toxic for tissue cultures.

C. F. Craig⁴ deals with the pathology of amœbiasis carriers, and he is in agreement with the general opinion that those who harbour *E. histolytica* in their large bowel without active symptoms of disease nevertheless show pathological lesions in the mucous membrane, so there is no such thing as a 'healthy' carrier of the infection. Such people are liable to develop diarrhoea or liver abscess at any time, so appropriate treatment should be carried out whether symptoms are present or not. As such carriers are estimated at 5 to 10 per cent of the population of the United States, between six and twelve million people may harbour the parasite, but it appears to be less pathogenic in temperate than in tropical climates.

J. H. St. John⁵ reports that an improved culture medium for *E. histolytica* can be made by adding heart muscle, as commonly used as an antigen in complement fixation tests. It is made by extracting 1 grm. of powdered heart muscle by boiling in Locke's medium, filtering and autoclaving 5 to 10 c.c. in test-tubes, and adding immediately before use 25 to 50 mgrm. of wheat flour.

D. A. Koch and A. C. Reed⁶ describe two atypical strains of *E. histolytica*.

TREATMENT.—A. C. Reed, J. A. David, and C. D. Leake⁷ report favourable results in amœbiasis from the use of a new arsenical preparation, 4-carbamino-phenyl arsonic acid ($\text{H}_2\text{O}_2\text{As}(\text{C}_6\text{H}_4.\text{NHCONH}_2)_2$), or 'Carbarsonne' for short. It was first prepared by Ehrlich, and is a tasteless white crystalline stable

solid, insoluble in water but soluble in alkaline aqueous solutions; it is much less toxic than acetarsone (stovarsol), and its 'therapeutic index' is eight times as great. From its composition it may possibly be toxic to the optic nerve, and it is contra-indicated in kidney or liver disease, as it produces renal necrosis in animals. It has been tried in forty patients showing *E. histolytica* in their stools, and many of them suffering from symptoms of amoebiasis, who were followed up and their stools repeatedly examined over an average period of four and a half months: thirty-six of them remained free from infection, and the only three cases that relapsed did not take the full course and remained open to reinfection. The average total dose was 4.1 grm., or 75 mgrm. per kilo of body weight, in the course of ten days orally, given in 0.25-grm. doses twice daily in hard gelatin capsules, making a total of 5 grm. The drug can also be given by a slowly administered enema alone, containing 2 grm. of carbarsone in 200 c.c. of warm 1 per cent sodium bicarbonate, after a cleansing alkaline enema, two hours after the evening meal, and repeated every other night five times. No toxic results have been observed, so further trials are indicated.

P. W. Brown and A. E. Osterberg⁸ also record their experience with arsenical preparations and conclude that "**Emetine** will continue to prove a bulwark for controlling the acute phase of the disease", but other drugs must be used with it to complete the cure in a large percentage of cases, for which purpose **Stovarsol** and **Treparsol** are of value, and the latter is the safer as it is more rapidly eliminated in the urine than stovarsol.

A. G. Biggam⁹ and others have treated 37 cases, mostly chronic forms of amoebic dysentery, with large doses of **Yatren** by the simple oral method—namely, four 0.25-grm. pills three times a day for fifteen days—with apparent cure in 72.2 per cent of a small series of 18 cases they were able to follow up. [The very high cost of this drug is unfortunate.]

Amoebic Liver Abscess.—Florence J. Murray,¹⁰ working in Korea, found amoebic dysentery to be many times as common as the bacillary form, with 42 admissions of amoebic dysentery and 23 of liver abscess during the years 1924–30. Only 8.6 per cent of the abscesses were in women, as usual, and none of these patients had been previously treated for dysentery, nor did any treated cases of amoebic dysentery develop liver abscesses. The open operation has been given up in favour of **Aspiration** and **Emetine** treatment with very good results; the drug is best given intravenously to avoid pain, and the average stay in hospital of such cases was sixteen days. Only one case died.

A. G. Biggam¹¹ reports an interesting case of liver abscess rupturing into the peritoneal cavity which was treated successfully by aspirating some chocolate-coloured fluid from the lower abdomen through a needle as the patient was too collapsed to permit of abdominal section being safely performed. A further trial of this plan is advised in such cases.

P. Manson-Bahr and T. P. Kilner¹² report further on cases of liver abscess seen in the London Hospital for Tropical Disease, where an average of three cases have been seen yearly subsequent to the war period. Aspiration is now the method of choice, and in the very rare cases requiring an open operation Kilner has used with advantage irrigation with small quantities of Dakin's solution or eusol though a Carrel tube brought out through the main dressing, and used every two hours at first and then every four hours.

(See also LIVER, SURGICAL AFFECTIONS OF.)

REFERENCES.—¹*Amer. Jour. Trop. Med.* 1932, Jan., 37; ²*Ibid.* 1931, Nov., 495; ³*Ibid.* 1932, March, 149; ⁴*Ibid.* July, 285; ⁵*Ibid.* 301; ⁶*Ibid.* 307; ⁷*Jour. Amer. Med. Assoc.* 1932, Jan. 16, 189; ⁸*Amer. Jour. Med. Sci.* 1931, Aug., 257; ⁹*Trans. Roy. Soc. Trop. Med. and Hyg.*, 1931, Nov. 30, 209; ¹⁰*Canad. Med. Assoc. Jour.* 1932, March, 312; ¹¹*Jour. Trop. Med. and Hyg.* 1931, Sept: 1, 285; ¹²*Proc. Roy. Soc. Med.* 1931, Dec., 233.

Robert Hutchison, M.D., F.R.C.P.

It is becoming generally recognized that infection with the *Entamoeba histolytica* may produce many symptoms other than those of acute or chronic dysentery. Such infections are often insidious and of long standing, vague abdominal discomforts, mild tenderness over the colon (especially the cæcum), flatulence, eructations, loss of weight, and tiredness being common symptoms (J. G. Thomson¹). Ian Macdonald² reports cases in which even duodenal ulcer and cholecystitis were simulated. Pulmonary infection may simulate bronchitis or tuberculosis, whilst in other cases the spleen, genito-urinary system, or brain may be attacked. The manifestations of the disease are therefore very protean, and it resembles in this respect syphilis and malaria. Further, amœbiasis is now known to be not uncommon in patients who have never been in the tropics, and Dobell, in 1921, found the parasite or its cysts present in the stools of over 3 per cent of 3000 normal persons examined in this country.

J. A. Macfadyen³ attaches importance to a peculiar degree of pallor—not the result of anæmia—in the diagnosis of these cases, but emphasizes the fact that the ultimate diagnosis must always rest upon the finding of the parasite or its cysts in the stools.

TREATMENT.—The immediate prognosis is good, but treatment must be prolonged and a year must elapse before one can state whether a cure has been effected. **Emetine** alone will rarely cure any but acute and recent infections, and in the chronic cases **Yatreñ** is more effective. **Bismuth Subnitrate** in massive doses (180 gr. three-hourly, and continued in lesser doses for six weeks) may be given with advantage after emetine.

REFERENCES.—¹*Practitioner*, 1932, July, 84; ²*Lancet*, 1931, ii, 1404; ³*Jour. Med. Assoc. South Africa*, 1932, Jan. 9, 16.

ANÆMIA: GENERAL CONSIDERATIONS.

Stanley Davidson, M.D., F.R.C.P.E.

In the 1932 number of the MEDICAL ANNUAL the reviewer dealt in great detail with the diagnosis, clinical manifestations, and treatment of the commoner blood diseases, particularly pernicious anæmia and the hypochromic anæmias. The reader is accordingly referred to last year's ANNUAL for information on these points. It is proposed this year to consider more particularly certain important considerations dealing with etiological problems and with recent advances in our therapeutic knowledge. These points are dealt with in the articles that follow.

Classification.—It is generally admitted that a satisfactory classification of the anæmias presents great difficulties. To be of practical value a classification must give information regarding three separate points: (1) The etiological factor concerned in the production of the anæmia; (2) The blood picture by which the anæmia can be recognized; (3) The treatment which might be expected to be of value. In addition, no modern classification could be accepted which did not fully recognize that some of the most important anæmias must now be considered to belong to the class of nutritional deficiency diseases. With these points in mind the present writer discussed the classification and treatment of the anæmias in a recent paper.¹

Pathology.—In the Goulstonian Lectures L. J. Witts² has reviewed in a masterly fashion almost everything of importance which is known about the pathology and treatment of anæmia. In an equally effective and brilliant manner, J. W. McNee,³ in the Croonian Lectures, discusses the clinical and pathological associations of the liver and the spleen. No person who is seriously interested in hæmatology can afford to miss these excellent contributions.

REFERENCES.—¹*Edin. Med. Jour.* 1932, xxxix, Nos. 7 and 8, 105; ²*Lancet*, 1932, i, 495, 549, 601, and 653; ³*Brit. Med. Jour.* 1932, i, 1017, 1068, and 1111.

ANÆMIA, PERNICIOUS. (*See also MENTAL DISEASE AND PERNICIOUS ANÆMIA.*)
*Stanley Davidson, M.D., F.R.C.P.E.***ETIOLOGY.**

The Intrinsic and Extrinsic Factors of the Gastric Juice.—The experimental work of W. B. Castle and his co-workers,¹ which the reviewer fully reported in last year's *MEDICAL ANNUAL* (p. 26), clearly demonstrates that Addisonian pernicious anæmia is a deficiency disease conditioned by the lack of a specific intrinsic factor present in normal human gastric juice and absent in that of cases of pernicious anæmia. In the normal individual the function of this intrinsic factor in the gastric juice is to interact with the extrinsic factor in the food to produce specific hæmopoietic effects. The interaction of these two factors may therefore be regarded as preventive of the development of pernicious anæmia in a normal individual. Conversely, the failure of this reaction to take place may be expected to result in the development of a macrocytic hyperchromic anæmia. The intrinsic factor of the normal gastric juice has been shown by these workers to be a heat-labile substance, not corresponding in its properties to hydrochloric acid, pepsin, or rennin. The extrinsic factor of the food has been tentatively described as being protein or a closely related substance. Three possible mechanisms exist by which a macrocytic hyperchromic anæmia may be produced—namely, a lack of the specific intrinsic factor of the stomach, a lack of the extrinsic factor of the diet, or the failure of absorption or utilization of the product of interaction of the intrinsic and extrinsic factors. Working on this hypothesis, it is possible to explain the various types of macrocytic hyperchromic anæmia which exist. Thus the classical case of Addisonian pernicious anæmia is due to a lack of the intrinsic factor. In sprue, in tropical macrocytic anæmia (Lucy Wills²), in the macrocytic anæmia of celiac disease (Janet M. Vaughan and D. Hunter³) and of gastro-jejuno-colic fistula (N. H. Fairley and T. P. Kilner⁴), the intrinsic factor is generally present, as would be presupposed from the fact that the gastric juice in the majority of cases appears to be normal; that the extrinsic factor is lacking is shown by the fact that high protein diets are known to be of value in these conditions, and that specific reactions have been reported as a result of vitamin B therapy. In certain cases of pernicious anæmia which are particularly resistant to treatment, and also in certain other macrocytic anæmias, defects of absorption may be involved, as well as a combination of the first and second mechanisms.

Achylia Gastrica and Achlorhydria.—The literature dealing with the relationship of achlorhydria to pernicious anæmia was so fully discussed in last year's *MEDICAL ANNUAL* (p. 27) that brief reference need be made to only three or four recent papers. Two excellent reviews of the subject have appeared, one by A. F. Hurst⁵ and the other by E. Moschcowitz,⁶ which reveal in every respect the close relationship which exists between achlorhydria and achylia and the Addisonian anæmia syndrome as well as the simple achlorhydric type of anæmia. J. F. Wilkinson⁷ details his findings in 208 cases of pernicious anæmia. This is probably the best individual contribution to the subject as yet published. W. B. Castle, C. W. Heath, and M. B. Strauss⁸ report some experimental work on this problem which is of great importance, and which may be summarized as follows:—

Since the intrinsic factor is neither hydrochloric acid nor any of the common enzymes of the gastric juice, an absence of hydrochloric acid or of such enzymes from the gastric juice does not explain the inability to react specifically with beef muscle as does normal gastric juice. There appears, therefore, to be no theoretical objection to the hypothesis that a patient with

pernicious anæmia might have an apparently normal gastric content, or that certain persons having a total anacidity indistinguishable by the usual clinical tests from that found in Addisonian pernicious anæmia might have a normal blood picture. To demonstrate that the existing tests for hydrochloric acid and gastric ferments do not necessarily show that the intrinsic factor is or is not absent from the gastric juice, Castle and Strauss⁸ undertook the following experiments: To each of two patients with a blood picture of pernicious anæmia, but with apparently normal gastric contents, beef muscle was given daily for ten days, without effect on blood formation. The fasting-juice of each of these two patients, secreted after histamine injection and incubated daily with beef muscle and the resultant material given to two typical cases of Addisonian anæmia, had no effect on blood formation in either case within ten days. Each of the two cases whose gastric juice was thus found to have no specific effect on beef muscle subsequently reacted positively to comparable doses of liver or liver extract by mouth: The evidence, therefore, appeared to be complete that the intrinsic factor was absent from the otherwise normal gastric contents of two cases of pernicious anæmia in relapse. Conversely the gastric juice of a patient with no evidence of disturbed blood formation, and of each of three patients with hypochromic anæmia, was found, even after histamine stimulation, to contain no free hydrochloric acid and little or none of the common enzymes of the normal stomach. The gastric juice of each of these four patients was incubated daily with beef muscle, and the resulting material administered to four typical cases of Addisonian anæmia, with positive effects on blood formation in each case within ten days. This, then, was proof that the intrinsic factor was present in the otherwise achylic gastric contents in a patient without anæmia, and in three patients with hypochromic anæmia.

It should be noted that C. W. Barnett⁹ was unable to confirm Castle's experiments, but as only one case was investigated the reviewer feels that Castle's contentions must at present be accepted. [The reviewer wishes to draw attention to the fact that in genuine Addisonian anæmia hydrochloric acid is present in less than 2 per cent of cases, and the absence of hydrochloric acid is therefore still a sign of great diagnostic value.—S. D.]

Vitamin B.—That vitamin B is in some way closely related to the anti-anæmic factor contained in liver now seems to be probable. The effects of vitamin B therapy in tropical macrocytic anæmia and celiac disease appear to be identical with those produced by liver extract therapy. In a recent paper by the reviewer¹⁰ dealing with the treatment of Addisonian pernicious anæmia with **Marmite**, it was shown that no therapeutic effect had been produced in several cases, while one responded. Since the publication of this paper four more cases of pernicious anæmia have been treated with vitamin B in doses of 1 to 2 drachms of marmite three times a day. Two failed to react but subsequently responded to fish liver extract, while the other responded with a rise in the blood level from 1 to 5 million, and has remained well on a maintenance dose of one teaspoonful of marmite daily for the past year.

M. B. Strauss and W. B. Castle¹¹ record a failure to respond to vitamin B therapy in a carefully controlled series of cases which received 12 gm. daily of an **Autolysed Yeast Product**. When this product was incubated with normal gastric juice and then fed to patients with pernicious anæmia a response was invariably obtained. On the other hand, A. Goodall¹² has recently reported a small series of cases of pernicious anæmia in the relapse stage which responded to large doses of vitamin B ($\frac{1}{2}$ oz. of marmite three times a day) with a reticulocyte response and a rise in the blood level, while a larger series of

cases in the remission stage maintained a satisfactory blood level for a period of many months on small daily doses of marmite. In view of the large amounts of marmite required to produce a response, it would appear more likely that the active principle is some amino-acid or other substance of great value in blood-building, rather than a vitamin, which in a nutritional sense can act in an extremely small quantity. Strauss and Castle, however, were so much impressed with the fact that vitamin B was present in every sample of material which was found to interact with normal gastric juice to produce a hæmopoietic effect, that they suggest that the extrinsic factor is in all probability vitamin B₂, or a substance closely related to it. Yeast products on this basis would have to be considered as the extrinsic factor in a most concentrated form.

It is difficult to explain why some cases of pernicious anæmia respond to treatment with vitamin B, while others with a similar blood picture fail to be influenced. If it is believed that marmite contains the final interaction product of the intrinsic and extrinsic factors, then every case should respond to it, and any failures would have to be explained on the basis of insufficient dosage. If, on the other hand, vitamin B merely represents the extrinsic factor in a particularly concentrated form, the variation in response to treatment could be explained on the degree of loss of power of the stomach to secrete the intrinsic factor. That this failure in secretion is slow and gradual, and not a sudden loss, is certain from the natural history of the disease. Moreover, there is good evidence to show that the power of secretion may be regained at least to some extent in the remission stage (L. S. P. Davidson¹³). On this basis natural remissions can be explained, while those cases which respond to vitamin B preparations would be assumed still to possess some slight ability to excrete the intrinsic factor.

In conclusion, it can be definitely said that a close relationship exists between the anti-anæmic factor contained in liver and vitamin B, and there the matter must be left until further evidence is forthcoming. In view of the exceedingly large doses of vitamin B preparations required, it is unlikely that in their present form they will replace liver extract or gastric tissue in the treatment of pernicious anæmia, except possibly in the remission stage. Nevertheless the possibility of a new method of treatment must be considered—namely, the ingestion of yeast products which have been previously incubated with normal gastric juice of animals, such as the hog. It has been suggested that by this means an increase of potency and a decrease in dosage could be obtained.

Pancreatic Insufficiency.—G. Cheyney and F. Niemand,¹⁴ from their investigations of the tryptic value of the fasting gastric contents of ten cases of pernicious anæmia, suggest that a possible relationship may exist between pancreatic insufficiency and pernicious anæmia. The evidence submitted, however, is not very convincing, and before this work could be accepted additional confirmatory investigations would have to be carried out.

Bothriocephalus Anæmia.—I. W. Birkeland¹⁵ presents a complete review of all the literature which has any bearing on the subject of the anæmia consequent on infestation with the fish tapeworm. This is one of the best papers on the subject the reviewer has ever read. It is important to recognize that the great majority of persons who harbour the fish tapeworm in their intestines suffer no ill effects from this parasite. Only a small percentage develop the pernicious anæmia blood picture. Achlorhydria is present in about 84 per cent of such cases. Following **Anthelmintic Treatment** acidity returns in about one-third of these cases.

DIAGNOSIS.

Macrocytosis.—Since an increase in size of the erythrocyte is the most important individual diagnostic feature of pernicious anæmia, any method which enables this information to be obtained must receive serious consideration. R. L. Haden,¹⁶ who must be looked upon as the pioneer in regard to the work of cell-volume measurements, rightly states that since the volume varies as the cube of the diameter it is apparent that the volume is a much more sensitive indicator of variation in size than is the diameter. By measuring the volume of the red cells in pernicious anæmia before and after treatment, he claims that the mean volume of the erythrocyte is the best index of satisfactory treatment, since the mean cell volume returns to normal. From a study of 152 cases of pernicious anæmia included in a series of 411 patients suffering from other diseases, and normal individuals, Haden concludes that a combination of macrocytosis of the erythrocytes and achlorhydria is seldom if ever found except in the presence of pernicious anæmia. Achlorhydria was demonstrated in every one of his 152 patients.

TREATMENT.

Mammalian Liver and Liver Extract.—So fully was this subject discussed in last year's MEDICAL ANNUAL (p. 33) that nothing further need be said in the present number.

A Hæmatopoietic Hormone.—R. S. Morris, L. Schiff, et al.¹⁷ report that when normal gastric juice was concentrated by distillation *in vacuo* to 3 to 5 per cent of its volume and then injected intramuscularly into a patient suffering from pernicious anæmia, a reticulocyte rise of 17.6 per cent resulted in thirty-six hours, with a coincident increase in the number of red cells. The authors note the failure of gastric juice to give results when administered orally, and further that it was practically ineffective when concentrated by evaporation. In a more recent paper¹⁸ they describe another case in which a patient suffering from pernicious anæmia was given 4 c.c. of a fraction obtained from 3 litres of swine's gastric juice by the measures already outlined. The blood-count before treatment was 1.6 million cells, hæmoglobin 50 per cent. The reticulocytes started to rise within twenty-four hours, reaching a maximum of 42.9 per cent on the tenth day, and remaining above 20 per cent for thirty-four days. Despite this remarkable reticulocyte rise the blood level remained almost stationary for the first two weeks (i.e., an increase of only 200,000 red cells and 5 per cent hæmoglobin) and the blood-count only reached 4½ million cells three months later. From experience of liver extract therapy one would have expected a marked rise in the red-blood-cell count within a few days of the occurrence of a 42 per cent reticulocyte crisis, and that the blood level would have reached normal within six weeks.

Confirmatory evidence of the work of Morris, Schiff, et al. is reported by H. M. Conner,¹⁹ who treated a case of pernicious anæmia with the injection of 18 c.c. of a concentrate obtained from 105 c.c. of a filtered gastric juice and produced a 20 per cent reticulocyte rise. On the other hand, J. F. Wilkinson²⁰ reports complete failure of a case of pernicious anæmia to respond to his concentrate of 1120 c.c. of human gastric juice.

If further investigations corroborate the fact that a single injection of highly concentrated gastric juice can produce a complete remission, it will be admitted that a very great advance in therapeutics has been obtained. Morris, Schiff, et al. suggest that there exists in normal gastric juice a substance of the nature of a hormone which presumably acts directly on the bone-marrow. If this theory were correct, it would be very difficult to fit it in with the excellent

experimental work of Castle and his co-workers, unless it were suggested that the material obtained by the concentration of gastric juice is re-excreted by the stomach after transport by the blood-stream in the form of Castle's intrinsic factor and thereupon acts upon the protein and vitamin B constituent of the food. This is extremely unlikely. (For cogent criticism of this work the reader is referred to a letter by J. F. Wilkinson.²⁰)

Fish-liver Extract.—Although Whipple found that fish liver was ineffective in the treatment of animals rendered experimentally anæmic by repeated bleeding, it is now certain from independent researches in America (J. E. Connery²¹), Norway (O. Hanssen,²² et al.), and in this country (L. S. P. Davidson²³), that fish liver is a potent source of the anti-anæmic principle required for the treatment of cases of pernicious anæmia. A highly potent fraction has been isolated in Aberdeen from cod, haddock, whiting, and monk fish, which is palatable to take and which was found by clinical trial in twenty cases of pernicious anæmia to double and treble the blood level of patients in the relapse stage within two or three weeks. Since fish liver can be obtained in certain centres in a fresh condition and at a fraction of the cost of mammalian liver, it should be possible to produce fish liver extract very cheaply. Such an extract will be on the market shortly at a much more reasonable price than any of the present mammalian liver preparations. The question of expense is of great importance in a disease in which treatment must continue for life, and is a potent factor in causing poor patients to consume insufficient quantities of the active principle. The subnormal blood level at which they live is recognized to be an important factor in the etiology of subacute combined degeneration of the cord.

Parenteral Liver Therapy.—In last year's MEDICAL ANNUAL the writer, in discussing liver preparations for intravenous and intramuscular injection (pp. 34-36), stated that these products had scarcely passed the experimental stage. The past year has shown great advances in this direction, and to-day they can be safely injected into patients with satisfactory results, as has been testified by J. F. Wilkinson,²⁴ L. S. P. Davidson,²⁵ I. Billing and W. N. West-Watson,²⁶ R. H. M. Lyon,²⁷ and others in this country; and by W. P. Murphy,²⁸ M. B. Strauss, W. B. Castle and F. H. L. Taylor,²⁹ J. E. Connery and L. J. Goldwater,³⁰ and others in America. The intramuscular route is generally admitted to be almost as rapid in its action as the intravenous method, and considerably less liable to produce any reaction—hence it must be considered to be the method of choice.

Dosage.—The majority of workers use preparations of a bulk of 5 c.c. which contain the extract from 100 grm. of liver. It is possible that smaller doses may be equally satisfactory, since there is evidence to show that the parenteral injection of the material from 10 to 25 grm. of liver may give satisfactory results. A daily injection is recommended for three or four consecutive days until the remission has commenced, as recognized by the reticulocyte rise. Thereafter a weekly injection should suffice.

Indications for and Advantages of Parenteral Treatment.—These may be summarized as follows: (1) Nausea and vomiting may be so severe that oral administration of any type of liver therapy is out of question; (2) The patient may be unwilling or unable to co-operate in taking oral therapy; (3) The patient may be critically ill, so that the time which elapses before getting a response may be an important factor in prognosis; (4) The possibility of the patient not taking the prescribed amount of liver or liver extract is obviated; (5) The patient may be refractory to oral treatment. For any of these emergencies parenteral liver extract therapy is of the very greatest value, and the reviewer is of opinion that, for routine purposes oral administration

will always continue to be the main form of treatment employed in pernicious anæmia.

Treatment with Certain Preparations of Stomach.—The value of hog's stomach preparation is now fully-recognized. J. F. Wilkinson,³¹ by the use of high pressure and a special apparatus, has been able to obtain a yield of 600 c.c. of juice per 1000 grm. of fresh stomach tissue. A daily dose of 150 c.c. was effective in the treatment of cases of pernicious anæmia. Precipitation with 90 per cent alcohol furnished a copious precipitate which contained the active principle. The reviewer suggests that this fraction contains the intrinsic factor of Castle.

Impotent Preparations.—In last year's MEDICAL ANNUAL (p. 33) reference was made by the reviewer to the fact that impotent preparations of liver were on the market, and that the practitioner would be well-advised to use only products sold by firms of high repute. J. F. Wilkinson³² examined sixteen preparations of commercial hog's stomach tissue on the market and found a great variation in activity, many products being totally inactive. The pepsin content was found to run parallel in most cases with the hæmatopoietic activity of the desiccated product.

Vitamin B Therapy.—This question is fully discussed in the section on ETIOLOGY (p. 27).

Iron.—Iron is of no value in the treatment of pernicious anæmia in the relapse stage, and it is seldom required at any stage if the patient is placed on a high protein diet containing 1½ lb. of liver a week, since this dietary is rich in organic iron. There are three types of case, however, in which iron may be of real value: (1) The case in which the patient reacts satisfactorily to liver extract therapy and reaches a count of between three and four million red cells, but thereafter the blood-level remains stationary, even on increased doses of liver and liver extract. The addition of 90 gr. of **Iron and Ammonium Citrate** daily may raise the level to normal. Most of these cases are elderly persons with arteriosclerosis and chronic sepsis. (2) With some of the new highly active liver preparations the red-cell count may outstrip the hæmoglobin level, and iron is then indicated. (3) In subacute combined degeneration of the cord large doses of iron as well as liver should be given, as recently suggested by W. Sargent³³ (*see below*).

Blood Transfusion.—K. Reich³⁴ reports a series of 25 cases of anæmia and 6 controls, in which the effects of blood transfusion on bone-marrow activity were studied. The percentage of reticulocytes in the peripheral blood was used as an index for bone-marrow activity. An increase of the red blood-count followed transfusion, which was associated with a decrease in the percentage of reticulocytes. Some time ago Robertson showed, from experimental transfusions of rabbits, that an aplastic state of the bone-marrow could be produced. Reich suggests that his findings are in keeping with Robertson's, and that, apart from the mechanical addition of red cells to the circulation, transfusion, by lessening the stimulus, may be followed by depression of bone-marrow activity. Minot and Lee observed a similar effect after large transfusions in pernicious anæmia. It is therefore important, when giving transfusions for bone-marrow exhaustion, that small amounts of blood should be administered at a time, in order not to decrease the natural stimulus to hæmopoiesis. These views are of considerable practical interest, since many persons believe that blood transfusion has a marked stimulating effect on hæmopoiesis.

Treatment of Cases Showing Subacute Combined Degeneration of the Cord.—W. Sargent³³ has treated 9 cases showing varying degrees of nervous disorders with large doses of **Iron (Blaud's Pill, 150 gr. daily)**. All have

improved. He suggests, therefore, that neural manifestations of anæmia are the result of iron deficiency and are independent of the blood changes consequent on the lack of the anti-anæmic factor contained in liver.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1930, Sept., 305; ²*Brit. Med. Jour.* 1931, i, 1059; ³*Lancet*, 1932, i, 829; ⁴*Ibid.* 1931, ii, 1335; ⁵*Quart. Jour. Med.* 1932, Jan., 157; ⁶*Arch. of Internal Med.* 1931, Aug., 171; ⁷*Quart. Jour. Med.* 1932, July, 361; ⁸*Amer. Jour. Med. Sci.* 1931, clxxxii, 741; ⁹*Ibid.* 170; ¹⁰*Lancet*, 1931, ii, 1395; ¹¹*Ibid.* 1932, ii, 111; ¹²*Ibid.* 781; ¹³*Brit. Med. Jour.* 1933, Feb.; ¹⁴*Arch. of Internal Med.* 1932, June, 925; ¹⁵*Medicine*, 1932, xi, 1; ¹⁶*Arch. of Internal Med.* 1932, June, 1032; ¹⁷*Jour. Amer. Med. Assoc.* 1932, March 26, 1080; ¹⁸*Brit. Med. Jour.* 1932, ii, 1050; ¹⁹*Proc. Staff Meetings Mayo Clinic*, 1932, vii, April 13, 213; ²⁰*Brit. Med. Jour.* 1932, ii, 1103; ²¹*Amer. Jour. Med. Sci.* 1930, clxxx, 603; ²²*Acta Med. Scand.* 1931, lxxvi, 26; ²³*Brit. Med. Jour.* 1932, ii, 1; ²⁴*Lancet*, 1931, ii, 791; ²⁵*Brit. Med. Jour.* 1932, i, 1; ²⁶*Ibid.* 273; ²⁷*Edin. Med. Jour.* 1932, May, 328; ²⁸*Jour. Amer. Med. Assoc.* 1932, March 26, 105; ²⁹*Ibid.* 1931, Aug., 313; ³⁰*Ibid.* 1932, March 26, 1059; ³¹*Lancet*, 1932, i, 719; ³²*Brit. Med. Jour.* 1932, i, 325; ³³*Lancet*, 1932, ii, 1322; ³⁴*Med. Press and Circ.* 1931, Nov. 22, 421.

ANÆMIA OF PREGNANCY.

Stanley Davidson, M.D., F.R.C.P.E.

The physiological anæmia of pregnancy was investigated by M. B. Strauss and W. B. Castle¹ by studying the blood, gastric secretion, and dietary histories of a group of normal women throughout pregnancy. More than half these women showed a marked decrease or absence of free hydrochloric acid in the gastric juice during pregnancy, with a return to normal following parturition. The women who had free hydrochloric acid and ate a satisfactory diet lost on an average only 5 per cent of hæmoglobin. The women with achlorhydria, or those who took a poor diet, had an average loss of 12 per cent, whereas three women with permanent post-histamine gastric anacidity had an average loss of 18 per cent hæmoglobin, in spite of a satisfactory dietary intake. These observations indicate the importance of direct dietary deficiency and deficiency conditioned by changes in the gastric juice in the etiology of the physiologic anæmia of pregnancy.

Of 35 women who had less than 45 per cent hæmoglobin during the latter half of pregnancy, or following parturition, 19 were achylie and 12 had little or no free hydrochloric acid following alcohol test-meals. In addition over two-thirds of these patients were found to have diets which were definitely deficient in iron and mineral elements, as well as in protein. None of these 35 patients made any significant improvement during control periods without therapy. Thirty had anæmia of the hypochromic type, which was unresponsive to liver extract but responded rapidly to large doses of Iron.

These observations on the hypochromic anæmia of pregnancy correspond to similar studies of idiopathic hypochromic anæmia, and indicate that the etiological factors of direct dietary deficiency and deficiency conditioned by gastric anacidity are common to both. Furthermore, an analogy may be made between the blood requirements of the fœtus and the chronic blood lack associated with certain cases of idiopathic hypochromic anæmia.

Five patients with anæmia of the hyperchromic type responded to **Liver Therapy**. One of these patients was fed with beefsteak alone during pregnancy, with no effect, but following parturition it had a distinct effect. Immediately thereafter beefsteak plus normal gastric juice was found to give a markedly positive effect. It is reasonable to believe in the light of these observations that the anæmia is due to the temporary loss of the intrinsic factor of the gastric juice during pregnancy, with an ultimate return occurring sooner or later after delivery. Hence the same etiological mechanisms hold for the anæmias of pregnancy as for similar anæmias in non-pregnant individuals, and like therapy is equally efficacious.

REFERENCE.—¹*Lancet*, 1932, i, 1198.

ANÆMIA, SIMPLE ACHLORHYDRIC.*Stanley Davidson, M.D., F.R.C.P.E.*

In last year's MEDICAL ANNUAL (p. 38) the symptomatology, signs, and treatment of simple achlorhydic anæmia were so adequately dealt with that little further need be said in the present edition. The economic importance of this disease cannot be overestimated, since the reviewer's experience suggests that it occurs considerably more frequently than Addison's pernicious anæmia. It causes prolonged chronic ill health, which is quite unnecessary in view of the remarkable results which can be obtained with iron treatment. The recognition that a dose some three times greater than that recommended by the Pharmacopœia is required for efficient treatment, cannot be too well known to the profession. The writer has treated a consecutive series of 50 severe cases with 90 gr. of **Iron and Ammonium Citrate** daily, with unqualified beneficial results.

DIAGNOSIS.

✓ **Spoon-shaped Nails and Glossitis.**—The recognition of spoon-shaped nails and atrophy of the papillæ of the tongue is a valuable indication of this type of anæmia, for they are present to some degree in the great majority of cases in which the hæmoglobin is below 50 per cent. The nature of these changes is not understood, but in all probability they may be classed as a nutritional disorder consequent on iron deficiency. In support of this view are the favourable effects produced on the nails when massive iron therapy is employed. The view generally believed, that this deficiency is always secondary to achlorhydia, cannot be completely substantiated. The reviewer has been impressed by the numbers of cases of pernicious anæmia (in which achylia is at its maximum) which have no nail changes, and he has also seen several cases which appeared to be typical of a simple achlorhydic syndrome, but which, following a test-meal, were found to have free hydrochloric acid. In one case, a man of 60 years of age who had dysphagia, marked glossitis, and spoon-shaped changes of the nails of a very advanced degree, hyperchlorhydia was found to be present. Although these nutritional changes in the majority of cases are caused by iron deficiency secondary to defective absorption consequent on achlorhydia, in some cases the deficiency is conditioned by inadequate intake or defective absorption from disease of the small intestine.

TREATMENT.

Iron.—A full review of the uses of iron in the treatment of anæmia is reported by A. J. Clark.¹

In the hypochromic anæmias iron, if given in sufficient quantity, produces results as dramatic and as effective as those which occur in the liver treatment of pernicious anæmia. Iron and ammonium citrate, 30 gr. three times a day, or Bland's pill, 45 gr. daily, are required.

The relative value of *inorganic* and *organic* iron in hæmoglobin formation is discussed in a very important communication by C. A. Elvehjen,² whose work on the catalytic effects of copper is so well known. He has shown by a series of experiments on white rats that: (1) In the absence of copper, organic iron (hæmatin) is as ineffective as inorganic iron (ferric chloride) for the cure of nutritional anæmia in rats. (2) In the presence of copper, organic iron promotes a partial cure of the anæmia in rats, but the regeneration is neither so rapid nor so complete as the recovery obtained when ferric chloride is used as the source of iron. (3) The hæmoglobin content of the blood of rats, which remained at from 6 to 7 grm. per 100 c.c. as long as hæmatin and copper were supplied, increased to 16 grm. per 100 c.c. in three weeks when

ferric chloride was added to the diet. (4) The iron contents of the livers from the different animals demonstrate that the decreased activity of the organic iron is due to the inability of the rat to assimilate the iron present in the hæmatin molecule. The iron content of the livers of rats fed on copper and ferric chloride was five times as high as the iron content of the livers of rats fed on hæmatin and copper. This is in keeping with the paper by Whipple and Robscheit-Robbins,³ in which they report a utilization of only 5 to 20 per cent of the hæmoglobin of red blood-cells when they were fed to dogs.

This paper clearly demonstrates that organic iron is not nearly so effective in the treatment of secondary anæmia as inorganic—a point of particular importance to clinicians. The author discusses what is meant by the term 'organic' iron. 'Food' iron and 'organic' iron are used interchangeably in the literature. This, he says, is obviously incorrect, because plant and animal material contain both *organic* and *inorganic* forms of iron.

Elvehjen's conclusions from his experiments are directly opposed to those of Bunge, who stated that all the iron in egg-yolk was present as hæmatogen, i.e., organic iron, whereas it has been found (R. Hill⁴) that the entire iron content of egg-yolk is inorganic iron. Similarly half the total iron in yeast is inorganic iron. Lastly, the author says the data available strongly indicate that a large part of organic iron occurs in the form of hæmatin, and this was the substance used in the experiments.

The reviewer is of opinion, however, that although the case is clearly made out for copper therapy in the nutritional anæmias of animals, i.e., milk anæmia of rats and possibly of infants, there are sufficient traces of copper in the foods and in the preparations of iron used, to make the additional use of copper unnecessary in the treatment of most anæmias.

The Response of Reticulocytes to Iron.—G. R. Minot and C. W. Heath⁵ found the height of the reticulocyte rise to be inversely proportional to the level of the red cells and hæmoglobin directly before treatment, but the relation was less exact in the anæmias responding to iron than in pernicious anæmia in response to liver or liver extract. It is well recognized that when the red-cell-count is 3 million or over in pernicious anæmia the reticulocyte response is insignificant. In low-colour-index anæmias with a similar red-cell-count, where the hæmoglobin is low, i.e., 20 per cent, a greater rise of reticulocytes occurs in response to maximal amounts of iron than in pernicious anæmia to adequate amounts of potent material. The reviewer has frequently noticed this, and it is no uncommon experience to get a 5 to 10 per cent reticulocyte rise with a red-cell level of 3 million, provided the hæmoglobin is very low. In one case of low-colour-index anæmia following prolonged menorrhagia, with a red-cell-count of $1\frac{1}{2}$ million and a hæmoglobin of 12 per cent, a reticulocyte response of 50 per cent was produced by maximal iron administration.

Copper.—See discussion of paper by Elvehjen.²

PLUMMER-VINSON SYNDROME: ANÆMIA WITH DYSPHAGIA.

G. Graham and R. S. Johnson⁶ found increased fragility of the blood to hypertonic saline in 6 cases of hypochromic anæmia with dysphagia. They suggest, therefore, that the anæmia is different from simple achlorhydric anæmia and belongs to a new specific type. The reviewer is doubtful whether the Plummer-Vinson syndrome should be considered as an etiological entity, except in so far as the blood picture and nutritional changes are the result of iron deficiency. While the majority of cases are achlorhydric, others with identical symptoms and signs have normal or even hypernormal quantities of acid (see the case referred to under DIAGNOSIS, p. 33). In 3 cases with acid in the stomach œsophageal examination revealed a membranous web which

was mechanically causing dysphagia. The nutritional changes in these cases may be presumed to be the result of defective iron ingestion from mechanical difficulties, and not of defective absorption as occurs in the achlorhydric state. In 3 cases in which fragility of the blood was tested it was found to lie within the upper limits of normality.

REFERENCES.—¹*Pharm. Jour. and Pharmacist*, 1932, June 18–July 9, 3; ²*Jour. Amer. Med. Assoc.* 1932, March 26, 1047; ³*Amer. Jour. Physiol.* 1927, lxxxiii, 60; ⁴*Proc. Roy. Soc. Lond.* 1930, Nov., 205; ⁵*Amer. Jour. Med. Sci.* 1902, Jan., 110; ⁶*Quart. Jour. Med.* 1932, Jan., 41.

ANÆMIA, SPLENIC. (See HÆMORRHAGIC DIATHESSES.)

ANÆMIAS OF INFANCY.

Reginald Miller, M.D., F.R.C.P.

The subject of the anæmias of infancy and early childhood is a difficult one. It is only to be supposed that they will result from causes peculiar to the time of life, and this is one reason for difficulty in attempting to correlate the anæmias of infancy to those of later life. Another is the difference in response at these early ages, thus making the interpretation of the blood pictures of both deterioration and repair a matter of special difficulty. In addition there are to be considered the increasing knowledge of the blood diseases of adults and the altering views now prevalent about their classification.

L. G. Parsons¹ states that it is impossible to classify the anæmias of infancy solely according to the blood picture, for a similar blood picture may be given by cases which have quite different pathogeneses. Nor has the appearance in the blood of primitive cells the same significance in infancy as it may have in later life. Again, it is not advisable to divide these anæmias into primary and secondary groups, but rather to regard all infantile anæmia as secondary to some disturbance in the child's health or to some defect in its diet. If we regard the pseudo-leukæmia of von Jakseh as a syndrome arising from many causes, and the leukæmias as neoplastic diseases and not a response of the blood to noxious stimuli, the anæmias of infancy may be classified as follows: (1) Those due to a defect of nutrition: (a) simple or dietetic anæmias, (b) endogenous or constitutional anæmias. (2) Those due to infection. (3) Those due to abnormal hæmolysis. (4) Those due to a combination of one or more of the preceding causes.

Anæmias due to Defect of Nutrition.—

a. Simple Nutritional Anæmia.—This is the type of anæmia, usually mild in degree, which arises in healthy babies fed on milk, which has, as has been recognized for many years, a low iron-content. To this class of anæmia H. M. Mackay² drew attention in 1929 (see MEDICAL ANNUAL, 1930, 288). She claimed that by the addition of iron to the milk this anæmia was prevented or cured. She used iron ammonium citrate, and it is interesting in view of what will be noted below, that this contains as an 'impurity' 1·7 mgrm. of copper per 100 grm. (Hart). Parsons considers it "clear that this large group of anæmic but otherwise healthy children can be regarded as constitutionally normal, and it therefore seems reasonable to conclude that the fall in hæmoglobin is to be sought in the absence from the diet of certain substances which are essential for hæmoglobin synthesis. Again, since the fall occurs late in the lactation period, it is probable that the infant is born with a store of this substance or substances which is gradually used up during this period."

The anæmia of rickets properly falls for discussion under the heading of nutritional anæmias, but doubt has been expressed as to its frequency. Some have even denied that it is a part of the rickets syndrome. G. F. Still and A. Marfan both regard anæmia as a manifestation of rickets, but A. F. Hess and

L. Findlay regard it as exceptional and the result of adventitious causes. It is curable by the administration of iron.

b. Constitutional Anæmias.—It is difficult to separate this type from the preceding, and probably there are borderline and mixed cases. Parsons regards as typical of this group the severe forms of anæmia occurring in very early life, particularly in premature children or twins, especially the results of first pregnancies. The degree of anæmia may be severe, even occasionally fatal, and in any case recovery does not occur for two or three years. They are not amenable to treatment by iron. The spleen may be moderately enlarged. This form of anæmia does not depend merely on defective iron-intake, as Kleinschmidt agrees; but the extra constitutional factor is at present unknown. Czerny regards these cases as due to a milk injury connected with fat metabolism.

Anæmia due to Infection.—The development of anæmia in cases of subacute or chronic infection is a well-known phenomenon, but Parsons thinks that the association between anæmia and pyelitis or pyelonephritis is not sufficiently well recognized in this country.

Anæmia due to Abnormal Hæmolysis.—Parsons discusses the relationship between the normal hæmolysis which occurs at birth and the anæmias of infancy. He holds that there is no association between jaundice at birth and the nutritional type of anæmia. Further, a more important point, he is of opinion that the anæmia following icterus gravis neonatorum differs from a nutritional anæmia and is properly classed as a hæmolytic anæmia. As proof of this he submits that no true intermediate cases between simple and grave icterus neonatorum have been found, whereas they should be common if the difference between the two is only one of degree; secondly, that nutritional anæmia is of the chlorotic type, whereas the anæmia following grave icterus is a severe hæmolytic form with an intense bone-marrow reaction as shown by a high reticulocyte count, large numbers of nucleated red cells, the presence of myelocytes, and a marked leucocytosis. Similarly the red cells in the anæmia following icterus gravis may be above the average in diameter, falling below normal in size as the anæmia improves.

Copper in the Treatment of Secondary Anæmia.—As has already been recalled, H. M. Mackay proved the existence of a common nutritional anæmia in infants, and this she measured by hæmoglobin estimations. Her work has been confirmed by I. A. Kotikoff,³ who measured the degree of anæmia by analysis of the blood for percentages of iron, which were found to be subnormal. With regard to the treatment of such anæmias there has been shown to be definite differences between the results of clinicians and those of experimental workers. Parsons gives an interesting account of these. Roughly speaking, clinicians have cured their cases by the administration of medicinal iron, while in the experimental anæmia of rats this has been of no value in the absence of copper. A long series of experiments by Steenbock, Waddell, Elvehjem, and Hart⁴ have shown that a milk-induced anæmia in rats could not be cured by the addition of pure iron salts to the whole milk diet, but required the addition of copper before cure resulted. Mackay's preparation of iron contained, as stated above, a small quantity of copper as an impurity, and other investigators have endeavoured to trace the influence of copper in the cure of the secondary anæmias of infants. H. Josephs⁵ was the first to try to form an opinion on the necessity of the use of copper, and he concluded that the formation of hæmoglobin was definitely accelerated by the use of this metal. M. S. Lewis⁶ also found that cure resulted much more quickly—a matter of weeks instead of months—where iron and copper were administered instead of iron alone. G. W. Caldwell and R. H. Dennett⁷ have very clearly established the same fact, using a

compound of iron and copper known as '**Copperin**' (M. I. Walker Co., New York). The copper probably acts as a catalyst, since only small amounts of it are required to enhance the work of iron in hæmoglobin synthesis.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1931, xcvi, 973; ²*Arch. of Dis. Childh.* 1928, iii, 117; ³*Lancet*, 1931, ii, 305; ⁴*Jour. Biol. Chem.* 1928, lxxvii, 777 and 797; 1929, lxxxiii, 243 and 261; 1929, lxxxiv, 115; ⁵*Bull. Johns Hopkins Hosp.* 1931, xlix, 246; ⁶*Jour. Amer. Med. Assoc.* 1931, xcvi, 1135; ⁷*Med. Jour. and Record*, 1932, March 16, 286.

ANÆSTHESIA. (See also LABOUR AND ITS COMPLICATIONS—RELIEF OF PAIN DURING LABOUR.) *J. Blomfield, O.B.E., M.D.*

The pros and cons of pre-medication continue to excite a large amount of controversial writing in the periodic literature of anæsthetics.¹ On the whole there is no doubt that the pros have it, and few anæsthetists to-day do not employ some form of premedication, even if they limit themselves to the now traditional 'morphia $\frac{1}{4}$ gr., atropine $\frac{1}{100}$ gr.' Among the comparatively new drugs used before operation most attention appears to have been given during the past year to the **Barbiturates** and to **Avertin**. Of the former group **Nembutal** has been used in increasing frequency in Great Britain, while **Sodium Amytal** appears to find a large number of supporters in the United States. The basal narcotics, paraldehyde, avertin, nembutal, etc., are by almost universal consent not used now at all with the idea of producing absolute anæsthesia, but only as preliminaries to soothe the patient, make easier his entry into full anæsthesia, and to diminish the amount of inhaled anæsthetic and undesired after-effects. Some anæsthetists prefer to produce unconsciousness,² or at least drowsiness, with their preliminary drugs, others insist that the effect should be something short of this.¹ The practical difficulty is the impossibility of foretelling with certainty the patient's susceptibility, for this varies greatly with regard to these hypnotic drugs. Consequently to give a set dose by the mouth, unless you have had the opportunity of trying this on the same patient beforehand, is to meet with occasional disappointment. For this reason some anæsthetists prefer when they are using barbiturates to give them by injection into a vein,³ when the result is rapidly produced and estimated, and the dose can be regulated accordingly. It must be admitted, however, that oral administration of nembutal, if combined with small doses of morphia, succeeds in the vast majority of instances.⁴

For purposes of estimating required doses Rowbotham² divides patients into four groups: (1) Children under 7, debilitated or severely toxic subjects, patients with high temperature; (2) Normal adults, and children over 7; (3) Alcoholics, athletes over 25 years of age, and very nervous patients; (4) Thyrotoxic cases. Using **Paraldehyde** per rectum as the pre-medication, Group 1 is given 1 drachm per stone of body weight three-quarters of an hour before operation. If the patient becomes unconscious during the introduction of the solution further administration of it is stopped. Atropine is given hypodermically if any anæsthetic other than gas and oxygen is to follow. Group 2 receive morphia $\frac{1}{4}$ gr. for every stone of body weight, one and a quarter hours before operation, followed by the paraldehyde (1 drachm per stone). Group 3 receive a full dose of bromide and chloral or of bromidia on the night before operation, repeated in the morning if the operation is in the afternoon. One and a quarter hours before operation they get morphia ($\frac{1}{4}$ gr. per stone) together with hyoscine ($\frac{1}{150}$ to $\frac{1}{100}$ gr.), and one hour before operation paraldehyde (1 drachm per stone). In the case of Group 4 a preliminary trial of the patient's reaction to hyoscine should be made some days previously. Bromide and chloral and morphine and hyoscine are used as for Group 3. The paraldehyde is given dissolved in olive oil, and, if the patient is still awake half an hour before operation, one half to two ounces of a 50 per cent mixture

of ether and oil is run into the rectum in $\frac{1}{4}$ -oz. doses, at intervals of five minutes, till he falls asleep. When avertin is employed the dosage for the groups is: Group 1, 0.05 to 0.08 gr. per kilo of body weight; Group 2, 0.1 gr. per kilo; Group 3, 0.12 gr. per kilo; Group 4, 0.12 gr. per kilo, with the addition of morphine and hyoscine, etc.

Numal,⁵ another barbiturate, is strongly recommended by P. Fredet, who has employed it in conjunction with morphine and scopolamine, and if necessary an inhaled anæsthetic, since 1925.

The importance of the proper use of **Suggestion**, for those who do not employ powerful pre-medication, is emphasized by Hornabrook,¹ who employs only small doses of morphia and atropine. Before induction the patient is told what sensations to expect and not to be worried by them, and to get the idea of sleep firmly in his mind. During induction he is told to go slack all over and to let his abdominal muscles go 'flabby like a jelly'. The author maintains that in this way good relaxation is secured even with small amounts of ether. The value of suggestion is also pointed out in an address on hypnosis and anæsthesia,⁶ and it is also observed that in cases of dangerous organic defects hypnotism may even be preferable to anæsthetics, or the two may be combined; and that persons who have been previously hypnotized make good subjects ever afterwards, and use may be made of this fact in the induction of anæsthesia should a surgical operation become necessary in such an individual.

The barbiturates are stated to be particularly useful as hypnotics in children undergoing oral operations, because of their slightly depressing effect on the respiratory function.⁷ Gollen and others have shown the influence of the emotions on the respiratory passages, from external nares and lips, muscles and blood-vessels of the airway, even to the bronchioles; and fear, causing struggling and crying with consequent congestion and mucus production, necessitates a deeper anæsthesia than would be otherwise required.

Sodium Amytal, given intravenously, is favourably reported on after an experience of 150 cases.⁸ A preliminary injection of morphia or morphine and atropine is approved of.⁹ If small or moderate doses are used there is no post-anæsthetic delirium, nor the long sleep with relaxation and its attendant hazards. A few instances of depressed respiration were met, but none of fall of blood-pressure due to the drug. The average dose is from 8 to 20 gr. given intravenously at the rate of 1 c.c. of a 10 per cent solution per minute. The solution must be freshly prepared and quite clear. Usually after 4 to 6 gr. the patient drops off to sleep. Complete unconsciousness follows 7 to 9 gr. as a rule, more than 15 gr. being very rarely needed. The pupils are normal or slightly contracted, colour little changed or slightly cyanosed or blanched, respiration shallow and increased in rate. With from 7 to 12 gr. the patient can usually be roused one hour after the end of the operation. There is no vomiting but there may be considerable restlessness. The best means of overcoming overdose, as shown by circulatory or respiratory failure, is stated¹⁰ to be ephedrine, $\frac{1}{4}$ to $\frac{1}{2}$ gr., and caffeine sodium benzoate, 7.5 to 10 gr., plus the use of CO₂ and oxygen. Sodium amytal is suitable for light narcosis and for basal anæsthesia. It is not recommended by itself for deep anæsthesia. The comparative merits of several barbiturates were tested by use at intervals on the same chimpanzee.¹¹ These were the findings for three drugs:—

	Dose per Kilo	Induction (minutes)	Recovery (swallowing)	Up (hours)
Dial ..	.. 55 mgrm.	25	30	48
Sodium amytal ..	.. 65 mgrm.	8	13	20
Nembutal ..	.. 40 mgrm.	5	6	10

Nembutal was found to depress the excitability of the motor cortex. Recovery from barbituric acid anæsthetics was found to take place more rapidly in a moist than in a dry atmosphere. Recovery after barbital poisoning (200 gr. were taken for suicide) is reported, in which intravenous administration of 20 per cent dextrose apparently played the decisive part, when death appeared imminent in spite of stomach lavage, coffee, and other treatment.²⁰

The latest intravenous preliminary sedative of which we have read is **Bromide of Sodium**.¹² It has been used in 60 cases with apparently excellent effect. Twelve to 15 grm. dissolved in 25 c.c. of distilled water are injected into a vein twenty-five to forty minutes before operation. No immediate reaction is visible, but the patient comes to the operating table in a state of calm. Small amounts of ether are used to get and maintain full anæsthesia. The colour remains rosy and relaxation good, even with light narcosis. It is notable, however, that among the operations performed not one was in the upper abdomen. Vomiting was notably absent, and the patient's return to consciousness and a normal condition rapid.

Danger of Heart Failure in Early Chloroform Narcosis.—Some interesting physiological experimental confirmation has been forthcoming of the usually accepted view. The author demonstrates¹³ that ventricular tachycardia occurs in about 50 per cent of people anæsthetized with **Chloroform**. This prefibrillation phase of complex ventricular irregularity is not in itself dangerous: its importance lies in the fact that it may easily lead to fatal ventricular fibrillation. The multiple ventricular tachycardia easily escapes clinical observation, since it may be associated with a regular and well-sustained pulse. The extra-systoles tend to be only slightly premature and the full diastolic filling allows the extra-systolic beat to discharge a volume of blood equal to a normal systole. These disturbances of cardiac action during early chloroform narcosis, indiscernible clinically, are detected electrocardiographically. Other observations on a patient during early chloroform narcosis¹⁴ led to the conclusion that the abnormal nodal rhythm shown by the electrocardiograph was of vagal

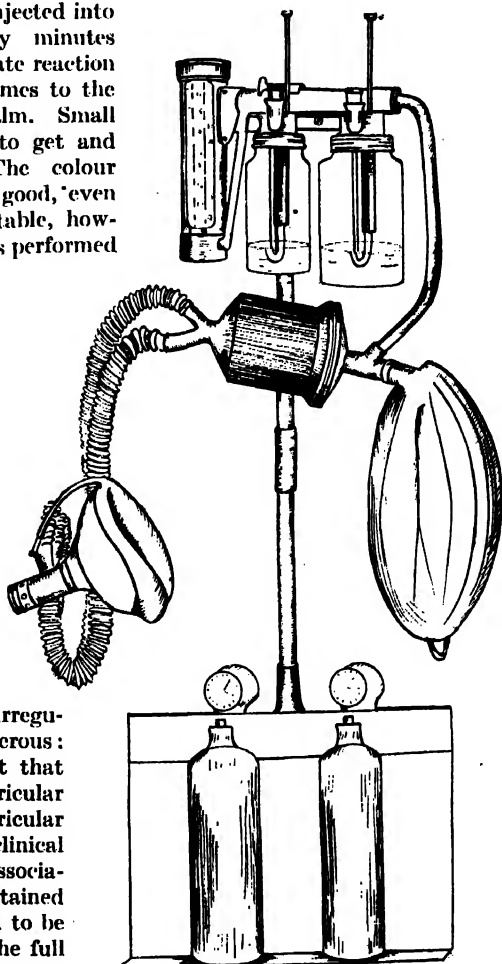


Fig. 3.—Absorber attached to Boyle's machine. The lower part of the drawing depicting the cylinders is diagrammatic, but the upper half is to scale. (Figs. 3-5 by kind permission of the 'British Medical Journal'.)

origin. "If the shifting of the site of origin of the systole from the normal position is due to vagal action then we are justified in assuming that this disturbance will be prevented by previous administration of atropine." The advantages of chloroform in major throat operations, particularly in association with oxygen, were the subject of a discussion in London.¹⁴

New Gas and Oxygen Apparatus.—Any device which can simplify gas and oxygen machines, or reduce the necessity for large or frequently renewed cylinders, is likely to be of great practical value. It is for this purpose that the principle of absorbing CO_2 by soda lime has been brought into practice,¹⁵ for by its use a small amount of **Nitrous Oxide** could be breathed over

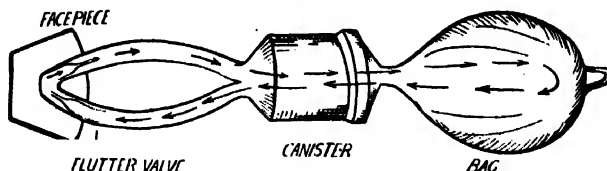


Fig. 4.—Diagram showing direction of flow.

and over again without the patient suffering from the accumulation of his own CO_2 , which would otherwise make constant rebreathing impossible. Figs. 3-5 show a recent method of putting this principle into practice. In the face-piece mount are two very fine flap-valves made from thin Paul's tubing. From this mount two 30-in. Siebe Gorman tubes run to a Y piece, which is connected with the absorber. The latter is about 4 in. long and 3 in

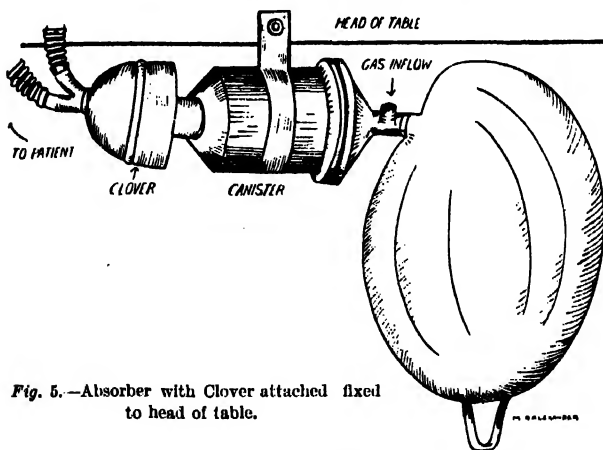


Fig. 5.—Absorber with Clover attached fixed to head of table.

wide, and holds one pound of soda lime granules. These are kept in position by two gauges at each end of the machine, one fine and one coarse. The absorber must be absolutely full of soda lime. Breathing is not obstructed. Attached to the soda lime canister is a bag of one-gallon capacity with a tube for the admission of oxygen. In practice only one or two gallons of nitrous oxide are needed per hour. One charge of soda lime lasts for about six to eight anæsthetic hours. The respiration rate with the absorber in use is quite unchanged; its depth, too, is almost unaltered, and is not nearly so great as that obtained with Clover's inhaler or similar closed apparatus.

Intravenous use of ethyl alcohol for anæsthesia has been demonstrated several times of recent years since Miguel Garcia of Mexico revived the method. Its

latest exponent¹⁷ combines the injection of **Alcohol** with that of **Glucose**, and believes that the process is admissible in cases of shock and of puerperal sepsis. Alcohol is held to cause hæmolysis and agglutination in blood if it reaches a concentration of about 14½ per cent, and it is largely a fear of these blood effects that has prevented its wide use as an anæsthetic. As regards ease of induction of anæsthesia and freedom from after-effects intravenous alcohol compares favourably with other methods.

Anæsthetics and Asthma.—Deep and prolonged anæsthesia has been used effectively for the treatment of asthma,¹⁸ and a case is also reported in which, after an operation under general anæsthesia, asthmatic attacks ceased for seven months.

The gravitational method of giving nitrous oxide, which many years ago was much practised in London by Flux, has been revived with a simple technique which permits of the introduction of ether as desired.¹⁹ "An open cone is prepared from newspaper and covered with a towel. A fresh one can be used for each case. An evaporating chamber is arranged by fixing a diaphragm of gauze, held by an adjustable metal ring, two inches from the distal end of the cone. In the evaporating chamber is placed a wad of fluffed washed gauze to serve as an evaporating surface. If the cone is seven inches high, a re-breathing space five inches deep is left below the evaporating chamber. This space is so warmed by expirations that even when ether is being evaporated in the chamber, the temperature in the re-breathing space is higher than that of the room." A few drops of scent can be put on the evaporating surface to start with, and the apparatus is light and comfortable to the face. **Nitrous Oxide** is introduced through a ¼-in. metal tube, 5 in. long, bent a hair-pin curve, and connected by rubber tubing to a gas-oxygen machine. The tube is hooked into the distal end of the cone, and a flow of one to two gallons of gas per minute instituted. Oxygen with 10 per cent CO₂ is added till the patient is satisfactorily under. Ether is then gradually added to the evaporating surface as required. "In the gravitational method we deal with the unaltered effect of the anæsthetic drugs without anoxæmia or carbon dioxide excess; there is no mechanical interference with respiration." The method appears to be excellent for feeble subjects and for children; we doubt its efficiency in connection with robust patients requiring complete relaxation for operations in the upper abdomen.

*The value of puncturing the right auricle*²² when resuscitation becomes necessary has been demonstrated. Two out of four patients were saved by this measure. In these cases there was no heart disease. In a group of forty with affected hearts eleven patients responded to auricular puncture. To puncture the right auricle a slightly curved needle, 5 in. long, is inserted in the third right intercostal space close to the border of the sternum; it is directed downwards and towards the middle line. In children the auricle lies within about 2 in. of the anterior surface of the sternum; in adults the depth varies from 3½ to 4½ in. It is shown in the article that probably when revival of a heart has been brought about by intracardiac injection of various drugs, it is the puncture rather than the drug to which the success should be attributed. It is also shown that five minutes is about the limit of time within which resuscitation must be applied if it is to be really successful. After that time the risk of damage to cortical cells is so great that even if the heart is restored there may never be any true recovery because of the brain damage. Short of direct cardiac stimulation, and always to be tried before it, is prompt inversion of the patient. This should always be the first means of resuscitation employed in primary circulatory syncope. The importance of warmth and rest in the treatment of white asphyxia of the newly born is recounted, and also the

desirability of superseding artificial respiration by the administration of 5 per cent CO_2 -oxygen to infants requiring respiratory assistance.

Explosions due to the ignition of inflammable or explosive vapours by sparks arising through imperfect electrical apparatus may have serious consequences when the fault concerns a lamp employed within the air-passages. The limits of explosibility of mixtures of ether and air and the varieties of sparks have been described,²³ and the low ignition temperature of ether and oxygen remarked on. At the same discussion the possibility was pointed out of ether vapour being picked up when air and oxygen were passed through the chloroform bottle only of a Shipway apparatus. A cock to obviate this was shown, as also a pencil light which made sparking impossible.

The anæsthetic properties of a number of oxides of ethyl have been experimentally and clinically investigated.²⁴ **Oxy-isobutyl Methyl** is described as being an excellent anæsthetic with an odour preferable to that of ether. **Iso-propyl Oxide** was used on fifty-three patients with gratifying results, but is regarded by the author as being too potent a narcotic for any but expert hands.

Propylene, which has frequently been the subject of experiment, produces anæsthesia in the human after eight inhalations on the average.²⁵ Its toxic action is primarily on the respiratory centre. Recovery from its action is very rapid even after ten minutes of narcosis.

Technique of Endotracheal Anæsthesia.—Magill²⁶ points out that the fundamental principle of the method is the provision by intubation of an airway that is proof against obstruction. Anæsthesia can be maintained on ordinary principles, no pressure is necessary, and the system can be an open or a closed one. Deep anæsthesia should not be needed for intubation, and this can be performed most easily through the nose.

Magnesium Salts Given per Rectum.—Experiments have shown that these are absorbed in sufficient quantity to produce insensibility, but the author does not believe that a practical means of anæsthesia is to be found in the method.²⁷

The effects of sublethal electric shocks of different kinds on the brain cells of animals have been observed.²⁸ The vessels on the surface of the brain were seen to be constricted or dilated during the passage of the current, depending on the kind of current used. In general the various combinations of lesions were characteristic of the effects of the different types of current. The observations are interesting in connection with the production of narcosis by means of electric effects on the cortex.

*The local use of ether in preventing secondary infection of wounds*²⁹ is explained by its bactericidal properties as well as by the increased phagocytosis which it causes. Used in primarily infected wounds it has made possible the successful use of immediate suture, and its local analgesic effect renders the process often painless enough to be performed without a general anæsthetic. When this is required it is needed in much diminished amounts. It is important not to leave considerable quantities of ether in the wound.

Status lymphaticus appears to be of frequent occurrence in the Western States of America,³⁰ however decidedly it is exorcised from British medical actualities. Instances are given which clinically and post mortem appear to be explicable by no other diagnosis, and an attempt is made to explain the pathology of the condition. This is held to be essentially a deficiency of the suprarenal cortex, in consequence of which the pancreas and liver lack their due hormones and do not function properly, "and there is a severe defect in body chemistry leading to death or, in partially compensated cases, to a condition of 'near-death' which we may call 'status lymphaticus'." The lymphatic glands and the thyro-thymic apparatus attempt to compensate for the lack of adrenal

secretion and its consequent toxæmia. Hence the enlarged thymus is a compensatory hyperplasia on the part of the thyroid-thymus defence mechanism.

'Secondary Saturation' by Nitrous Oxide.—The fact that all anæsthesia is accompanied, if not caused, by lowered oxidation is made the basis of an argument in favour of 'secondary saturation' by nitrous oxide rather than deep narcosis with ether as the best means of procuring complete relaxation for surgery in the upper abdomen. The gas and oxygen is given endotracheally.³¹ The author maintains that blueness with nitrous oxide is not necessarily indicative of an asphyxia of the tissues as severe as may be caused by deep narcosis through ether or chloroform with plenty of oxygen, and he maintains that the condition produced by nitrous oxide and anoxæmia is much more quickly recovered from than is the state accompanied by complete relaxation induced by the more potent anæsthetic agents.

An excellent account of the use of gases for anæsthesia in various countries and a forecast of the anæsthetist of the future is given in the *Medical Journal of Australia* (1932, Jan. 2, 7-10).

Uses of Carbon Dioxide.—Carbon dioxide has been much in use by anæsthetists for stimulating breathing and thus hastening either induction of anæsthesia or elimination of an anæsthetic. Now a further function has been found for the gas. Carbon dioxide has been used successfully to control *hiccup*. The high percentage of 30 CO₂ to 70 oxygen was used, and relieved the hiccup, which had persisted for nine days after operation, 'positively and immediately'.²¹

When the fall of blood-pressure in spinal analgesia is severe and needing treatment, if the motor nerves of respiration are not at the same time paralysed, 5 to 10 per cent carbon dioxide in pure oxygen is a valuable means of restoring the patient's condition.³² If there is paralysis of the motor nerves of respiration (phrenics and intercostals), only artificial respiration, followed secondarily by vasoconstrictor stimulation, can be of service. The author states that so far from doing away with the necessity for an anæsthetist, special methods make the presence of one of great training especially necessary, as there is greater frequency of serious complications than with inhalation anæsthesia, and the surgeon cannot attend to these during operation. The two great dangers are respiratory collapse of central origin from a functionless medulla oblongata due to ischæmia, or of peripheral origin through blocking of the motor nerves of respiration.

The advantage of absorbing expired carbon dioxide during anæsthesia is not limited to nitrous oxide administrations only: its use in connection with ether rebreathing offers a means of conserving not only ether vapour but also the heat and moisture usually lost through exhalation.³³ A constant small stream of oxygen has to be admitted. There is no expiratory valve; when emptying of the circuit is needed the face-piece is simply lifted off the face. The apparatus should fit accurately so that there is no adventitious admission of air. The tendency with this technique is towards a rise in body temperature rather than the usual fall during anæsthesia. The warm atmosphere leaving the alveoli during each respiratory cycle passes out through the soda lime, where the carbon dioxide which it contains is left as a carbonate, and this same atmosphere again enters the lower respiratory tract during the next inspiration. There is a tendency to the production of heat in the mass of soda lime because of the chemical action between it and the absorbed carbon dioxide. This heat is not excessive, however, unless pure CO₂ is admitted into the system. Then a temperature of 100° C. may be reached in the centre of the soda lime. The canister of soda lime should be removed if high concentrations of carbon dioxide are desired in the respiratory atmosphere. The respirations during inhalation

anæsthesia conducted with a soda-lime absorber more nearly resemble those of ordinary sleep than when the same drugs are inhaled in any other manner. The maintenance of the inspired vapour at body temperature may be responsible for this. With this technique the respiratory tract is filled with an atmosphere saturated with moisture. Since dehydration is one of the unphysiological accompaniments of inhalation anæsthesia the constant inhalation of a saturated atmosphere with a minimum loss of water from the body by exhalation is of decided benefit. The humidity also banishes explosion possibilities when ethylene or acetylene are used in the circuit. Two ounces of ether, used with this closed circuit CO_2 -absorbing technique, suffice for the maintenance of the most profound abdominal relaxation. The advantage of having so little ether to eliminate afterwards is obvious; as is the freedom of the air of the operating room from exhaled vapours. Bacteriological investigations have proved that there is no danger of contamination, through the canister, of any patient by the preceding one. Further comment on the use and abuse of CO_2 and on the use of soda-lime absorption is provided.³⁴

It is maintained that if catarrh and pathogenic organisms are present in the respiratory tract before operation carbon dioxide will minimize the untoward effects of the operation and the anæsthetic by stimulating the liquefaction and the expulsion of the viscid secretion within the air passages.³⁵ Carbon dioxide is used towards the close of operation and afterwards for five-minute periods during twenty-four to thirty-six hours.

LOCAL ANALGESIA.

New Analgesics.—**Larocain**,³⁶ a new Roche synthetic substitute for cocaine, has been used in a large number of instances by German anæsthetists with satisfying results. **Novutox** also continues to find favour. This is a preparation which contains novocain, adrenalin, chinotoxin, and benzoic acid, with calcium, sodium, or potassium chlorates. It is antiseptic as well as analgesic and has value as a preservative.³⁷

The occurrence of late hæmorrhage after Percaine used locally is recorded, and the author states that no patient operated on in that way should be allowed to go home, but must be kept under observation for hours after.³⁸ Paynjon has been well satisfied with percaine for local analgesia.³⁹

Deep block anæsthesia of the second and third divisions of the fifth nerve is described.⁴⁰ The injections do not have to be made with the accuracy demanded of alcohol injections in the same area for cure of trigeminal neuralgia, as novocain has not the same damaging power as alcohol. The technique is described and the list of operations given, which includes operations for tumours of jaw, carcinoma of antrum, and plastic repair of lip.

The simplification of pre-operative examination and treatment when local anæsthetics are used for abdominal surgery is pointed out, and it is also maintained that the conditions after operation are far superior to those following general anæsthesia.⁴¹ A detailed critical comparison is compiled of old and new analgesic preparations.⁴² An apparatus is described for use in infiltration anæsthesia without the possibility of introduction of air and with more or less pressure as desired (*Plate IV*).⁴³ A new route for introduction of local analgesics for operations in the upper abdomen is described; a solution of 1-1000 **Pantocaine** is introduced through a catheter placed in an opening made into the lesser omentum.⁴⁴ The effect of using only local anæsthesia in reducing the morbidity of surgery of accidents is related.⁴⁵ Percaine has been found so satisfactory when applied to mucous membranes that in these circumstances it should replace cocaine.⁴⁶

PLATE IV

INFILTRATION ANÆSTHESIA

(KIRSCHNER)

Apparatus for use in infiltration anaesthesia.

*By kind permission of
'Deutsche Zeitschrift für Chirurgie'*

SPINAL ANÆSTHESIA.

Spinal anæsthesia increases in popularity. A series of 1000 cases without a death is reported.⁴⁷ A number of points to be observed for avoidance of post-operative headache are given in detail. **Novocain** was the agent mostly employed. The action of spinal anæsthesia in labour is to retard it.⁴⁸ It may be used till the end of the second stage in normal patients but will increase the "necessity for elective artificial delivery." The minimum blood-pressure under spinal anæsthesia occurs within half an hour, whatever drug is used.⁴⁹ No drug avails to correct the fall of blood-pressure when once it has occurred, but artificial respiration and carbon dioxide with oxygen are effective most often.

Percaine (Nupercaine) for spinal anæsthesia continues to find warm support.⁵⁰ It is said to cause less lowering of blood-pressure than the other agents, and its analgesic effect certainly lasts longer. The especial advantage of spinal anæsthesia in acute obstruction is illustrated by cases.⁵¹ Signs of cerebral irritation and thermal reactions have occasionally been noted after the use of percaine.⁵² The most important danger signal with spinal anæsthesia is respiratory embarrassment, not falling blood-pressure, which has excited so much clinical attention.⁵³ Artificial respiration is the chief remedial measure. A series of 1600 cases with **Tropacocaine**, including one death in a woman of eighty, is recorded.⁵⁴

*Peridural anæsthesia*⁵⁵ is achieved by depositing the anæsthetic in the epidural space instead of inside the theca. It is said to gain the effects of endotheal injection without its risks, but it seems an uncertain method. The degree and duration of the anæsthesia admittedly vary greatly. From 30 to 60 c.c. of 1 per cent novocain solution are injected.⁵⁶ Exact instruction is given how to know when the peridural space is entered.

The way in which solutions injected into the spinal canal act is lucidly explained by Howard-Jones,⁵⁷ who demonstrates the fallacious theories associated with Pitkin's and other methods. This author maintains that the danger in spinal anæsthesia is not a vasomotor effect from block of thoracic and lumbar roots but from blood-absorption and paralysis of the vasomotor centre. The vomiting which so often occurs he refers similarly to stimulation of the vomiting centre by the injected drug. He prefers percaine because it is capable of producing a prolonged effect on nerve-fibres in such high dilution that the rate of absorption into the blood is very slow.

From a series of 533 cases⁵⁸ the authors conclude that spinal anæsthesia "carries with it a higher mortality on the table than other forms of anæsthesia in our hands." They used at first spinocain, and later neocain, digesting the crystals in cerebrospinal fluid and not employing barbotage.

General opinion with regard to the use of **Ephedrine** in association with spinal injection seems to be crystallizing to the effect that to be of service ephedrine must be injected half an hour or so before the spinal injection is made. Its power to raise the blood-pressure when it has once been lowered by the spinal injection is doubtful. Ephedrine with caffeine⁵⁹ injected hypodermically half an hour before the spinal dose is said to have excellent effects in preventing fall of blood-pressure and feelings of nausea. Another observer prefers to inject the ephedrine only ten minutes before the spinal injection.⁶⁰

AVERTIN.

Avertin has been much used and written about during the last year. Its possible danger by causing *respiratory depression* is said to be thoroughly controlled by the use of **Coramin**.⁶¹ Moerl reports the saving of a patient

by injection of coramin "who would have been lost on account of severe respiratory paralysis after the avertin anæsthesia." Widenhorn, who has had a large experience, says that in case of danger 6 c.c. of an aqueous solution of coramin are to be given intravenously, and as a regular practice to secure hyperventilation and an abridgement of post-operative sleep 2 to 3 c.c. coramin intravenously and at the same time 5 c.c. intramuscularly. It is to be noted that this author uses preliminary hypodermics of morphine and atropine as a routine, and this practice probably makes the occurrence of respiratory depression more likely than if avertin alone is employed. Coramin is stated to produce an effect similar to that of lobelin, but more lasting.⁶² **Ephedrine** also has the power of interrupting or shortening the narcotic effect of avertin.⁶³ In several patients in whom considerable fall of blood-pressure was witnessed during avertin narcosis the condition is stated to have been not due to surgical shock because the venous oxygen was within normal limits. The condition is "less grave than surgical shock," but on account of its possible appearance the author prefers to avoid avertin when shock is likely to arise.⁶⁴ Several French contributions have appeared in commendation of avertin, and Desmarest⁶⁵ has introduced to that country the combined anæsthesia of avertin and nitrous oxide, which has been for some time in favour in Great Britain.

From a study of 70 cases, including 24 laparotomies, the authors⁶⁶ conclude that the use of avertin with small amounts of novocain and very small doses of nitrous oxide provides an anæsthesia "from the patient's point of view the most pleasant that we have hitherto employed, while operations under such conditions are associated with less shock than by other methods, and there is a greater freedom from disturbing phenomena." In six cases there was full anæsthesia from the avertin alone, and the authors insist on the importance of keeping the dosage down to a maximum of 0.1 gr. per kilo of body weight.

The value of avertin in the treatment of *tetanus* is well illustrated by the history of two cases. These show the great number of repeated injections (28) that can be tolerated without harm.⁶⁷

From an experience of 700 cases the authors find avertin, supplemented by nitrous oxide and, if necessary, ether, a satisfactory anæsthetic and recommend it especially for children.⁶⁸ The CO₂-combining power of the blood does not drop, nor its sugar-content rise, so much after the combined drugs as after avertin alone. A good comprehensive criticism of avertin, with an account of the author's wide personal experience of the drug, is provided, and concludes with a highly favourable judgement.⁶⁹ Widenhorn relates 1500 cases of the combined method without fatality.⁷⁰ Avertin is strongly bactericidal.

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⁴⁰*Surg. Gynecol. and Obst.* 1931, Dec., 832; ⁴¹*Lancet*, 1932, i, 666; ⁴²*Münch. med. Woch.* 1932, April, 545; ⁴³*Deut. Zeits. f. Chir.* 1931, Oct., 99; ⁴⁴*Ibid.*, 135; ⁴⁵*Surg. Gynecol. and Obst.* 1932, Feb., 378; ⁴⁶*Brit. Med. Jour.* 1931, ii, 986; ⁴⁷*Med. Jour. and Record*, 1932, June, 507; ⁴⁸*Amer. Jour. Surg.* 1932, June, 466; ⁴⁹*Jour. Amer. Med. Assoc.* 1932, June 26, 2092; ⁵⁰*Ibid.* 2090; ⁵¹*Brit. Med. Jour.* 1932, i, 882; ⁵²*Surg. Gynecol. and Obst.* 1932, May, 826; ⁵³*Ibid.* June, 882; ⁵⁴*Deuts. Zeits. f. Chir.* 1932, April, 599; ⁵⁵*Med. Jour. and Record*, 1932, Feb. 17, 165; ⁵⁶*Zentralb. f. Chir.* 1931, Dec. 18, 3141; ⁵⁷*Brit. Med. Jour.* 1931, Sept. 12, 490; ⁵⁸*Ann. of Surg.*, 1931, Oct., 738; ⁵⁹*Lyon Chir.* 1931, Nov.-Dec., 722; ⁶⁰*Bull. et Mém. Soc. nat. de Chir.* 1912, Jan. 28, 82; ⁶¹*Anæsthes. and Analges.* 1932, Jan.-Feb., 37; ⁶²*Münch. med. Woch.* 1932, March 26, 520; ⁶³*Anæsthes. and Analges.* 1932, Jan.-Feb., 37; ⁶⁴*New Eng. Jour. Med.* 1932, March 24, 609; ⁶⁵*Presse méd.* 1932, Feb. 17, 257; ⁶⁶*Canad. Med. Assoc. Jour.* 1931, Nov., 587; ⁶⁷*Amer. Jour. Surg.* 1932, Jan., 11; ⁶⁸*Ann. of Surg.* 1931, Nov., 885; ⁶⁹*Med. Jour. of Australia*, 1931, June 20, 737; ⁷⁰*Deut. Zeits. f. Chir.* 1932, April, 573.

ANEURYSM. (See also BLOOD-VESSELS, SURGERY OF.)

ANEURYSM, ARTERIOVENOUS.

A. G. Gibson, M.D., F.R.C.P.

B. T. Horton¹ records 24 cases of *congenital arteriovenous fistula* of the extremities, seen at the Mayo Clinic in two years. The remarkable fact is that in one case only was the diagnosis made previous to admission. They had previously been considered as varicose veins or, if ulcers were present, as varicose ulcers. In 12 cases the abnormality had been noticed at birth. The points in diagnosis, in addition to the dilated veins, are an increase in the surface temperature as compared with the opposite limb, and the presence of a bruit at the site of the arteriovenous fistula; this last, however, was present in 8 cases only. In a small number of these cases there was cardiac hypertrophy, which must be caused by the extra amount of blood returning to the right side of the heart, but the degree of hypertrophy in the cases examined bore no relation to pulse or blood-pressure. The blood-pressure was raised in one case only. When the fistula is closed by digital compression the pulse-rate tends to diminish. There is an increased length of bone in the extremity affected, and the bones show trophic changes. There was atrophy of the bone in 3 cases and arthritis in 5. The final test which can be applied in the determination of this lesion when other signs are doubtful is to estimate the oxygen content of the deep veins of the extremity concerned as compared with the blood from other veins in the same patient. The importance of this investigation lies in the fact that the malady is mistaken for varicose veins. In one case, indeed, a cure was apparently effected by seven injections of **Quinine-Ethyl Carbamate**. In 4 others in which ulcers were present they were healed by the use of heavy rubber bandages.

M. R. Reid² writes upon the *effect of arteriovenous aneurysms upon the heart*. The increasing volume of blood reaching the right heart adds a strain to its action, leading to hypertrophy or even insufficiency. A case is recorded of femoral arteriovenous aneurysm in a man of 25 years in whom it had been noticed for seventeen years. The communication was in the left thigh just below Poupart's ligament, almost at the level of the profunda femoris artery. It had resulted from a gunshot wound, and he had carried on his work and play for a number of years without being conscious of any other discomfort than the noise of the aneurysm and varicosities of the leg and groin. After a few years he had been told that his heart was greatly enlarged, and he had more recently become conscious of disordered heart action and shortness of breath. He had himself found that manual pressure on the site of the aneurysm made his heart feel better, and the left foot, which had shown a tendency to go cold, to feel warmer. Surgical excision of the arteriovenous aneurysm relieved the cardiac symptoms, and the heart returned to a normal size. The author refers to Matas' teaching that previous to operation on these cases a

period should be devoted to temporary occlusions in order to stimulate collateral circulation in the leg, to minimize the danger of peripheral gangrene, and to effect some adaptation of the heart to the altered conditions of the circulation.

REFERENCES.—¹Jour. Amer. Med. Assoc. 1932, Jan. 30, 373; ²Ann. of Surg. 1932, April, 578.

ANGINA, AGRANULOCYTIC. (See AGRANULOCYTOSIS.)

ANGINA LUDOVICI. (See LUDWIG'S ANGINA.)

ANGINA PECTORIS AND CARDIAC PAIN. (See also CORONARY ARTERY DISEASE) A. G. Gibson, M.D., F.R.C.P.

In a paper on its significance, F. Kellogg and P. D. White¹ state that *precordial tenderness* may occur in a person with a hypersensitive nervous system with or without serious heart disease. The combination of a sensitive nervous system and heart disease is more potent than either condition separately. Nervous irritability and fatigue are of greater importance in producing precordial tenderness than is organic cardiovascular disease, for in cases of rapidly fatal coronary thrombosis there may be no tenderness whatsoever.

C. H. Miller² discusses the *difficulties of diagnosis between gall-bladder and cardiac pain*. The innervation of both the heart and the gall-bladder is from neighbouring parts of the central nervous system, and most practitioners have had cases in which the difficulties of diagnosis have been great. He refers to the case of an elderly Jewess who had been treated for angina pectoris. The author saw her in one of the attacks in which the pain was located on the left side of the sternum and in her arms. Two months later she was admitted to hospital with jaundice and a large gall-bladder, which was surgically treated, and the attacks of pain ceased following the operation. He reports also similar cases in a married woman aged 56, and in two medical practitioners, and also three cases in the hands of other doctors. In all of these the heart had been suspected as primarily at fault. Cases of this nature are scattered throughout medical literature from the early part of the present century, and are referred to in this paper.

The clinical task of distinguishing the pain of angina from the pain of cholecystitis can only be solved by a very exhaustive clinical examination, in which the electrocardiograph may give help. It must be remembered that patients may have myocarditis together with cholecystitis and colic. A full investigation of the gall-bladder by X rays is also desirable. In any case with or without myocarditis it is desirable that the patient with gall-bladder disease should be given the benefits of surgery.

R. L. Levy and R. L. Moore³ give an account of their experiences with *paravertebral injections of alcohol for the relief of cardiac pain*. Their method is as follows: The patient is placed on the right side with the knees bent up, the skin of the back having been prepared with iodine, and the spines of the first five dorsal vertebræ are marked with acriflavine. Dots are then made 4 cm. to the left of each of the marked spines, and the skin infiltrated with a 1 per cent solution of procaine hydrochloride at each of these points. A needle 8 to 10 cm. long is now inserted vertically through the skin at each of these points until it touches the border of the underlying rib. It is then necessary to shift the needle so that it points mesially at an angle of 45°. It is now pushed in 2 cm. farther. Whether the pleura has been entered can be ascertained by connecting the needle with a water manometer. If respiratory

oscillations are present, the needle is withdrawn and re-inserted: 5 c.c. of the 1 per cent solution of procaine hydrochloride is then injected through each needle, and after an interval of ten minutes 5 c.c. of an 80 per cent solution of alcohol. There is developed as a result of this procedure an area of necrosis, followed by fibrosis. This area is usually not more than 1 cm. The authors insist on the necessity of accuracy, but they say the procedure is simple after practice on the cadaver. Of their patients, 51 per cent obtained complete or almost complete relief for a variable time. In one case there had been complete relief for sixteen months. A majority of patients had hyperæsthesia of the chest and painful intercostal neuritis in the distribution of the nerves treated. Such hyperæsthesia is apparently unavoidable and may last for six weeks. In two cases only was there pleural effusion.

C. Eggleston and S. Weiss⁴ recommend *intravenous injections of glucose in angina pectoris*. The solution is made from pure Glucose in freshly distilled water; they begin with 30 c.c. of 1 per cent solution, increasing up to 150 c.c. of higher percentages up to 20 per cent. They give the dose according to no fixed method, but recommend three injections weekly. They add occasionally to the solution **Strophanthin** (0.2 to 0.3 mgrm.) or **Theobromine Ethylenediamine** (50 mgrm.). They record good results in patients suffering from the angina of effort.

Paravertebral injections of alcohol are reviewed by the same authors.⁵ They refer to Platnew's results, but recommend repeated injections of 5 c.c. of 1 per cent novocain in the region of each ganglion, followed a few minutes later by 5 c.c. of 70 to 80 per cent alcohol. These injections should be repeated weekly, and the patient prepared the previous evening by a dose of morphine. Lasting results are recorded in 3 out of 22 cases and total failure in 2 cases.

The operative treatment of angina pectoris is discussed by W. M. Yater and A. P. Trewhella.⁶ They agree with the general opinion that it must be reserved for the most severe cases. They report the case of an asbestos worker, aged 55, in whom novocain and alcohol injections of the ganglia failed. Removal of the left superior cervical ganglion was followed by almost complete freedom from pain for two weeks. The pain, however, returned and the patient ultimately died. The coronary arteries were markedly sclerosed, the descending branch of the left coronary completely occluded, and there was an old aneurysm of the left ventricle, the result of a previous infarction. The authors review the operations that have been done in this malady, and the conclusion in this series is that in 40.5 per cent of all cases there was complete relief. Disagreeable symptoms or serious complications were present, however, in 31 per cent, who were made less comfortable. The reason for this discomfort was paræsthesias and pains in other neighbouring parts—brachial neuralgia, pain on chewing, pain in the shoulder, and paralysis of the vocal cords—so that while operation itself holds out some hope of relief it is therapeutically adventurous, and the authors prefer alcohol injections following novocain.

L. Langeron⁷ refers to the *treatment of angina pectoris by peripheral injections of stovaine*: 1 per cent of **Stovaine** is used and injected into the skin or subcutaneous tissues wherever the patient indicates that he has peripheral pain. It may also be used for peripheral pains from other causes. About 10 c.c. of the solution may be required and the injection may be repeated at intervals of a few days. The patients whose histories are recorded were considerably relieved and enabled to go about in greater comfort.

REFERENCES.—¹*New Eng. Jour. Med.* 1932, March 31, 659; ²*Lancet*, 1932, i, 767; ³*Arch of Internal Med.* 1931, July, 146; ⁴*Amer. Jour. Med. Sci.* 1931, Sept., 422; ⁵*Ibid.* Aug., 282; ⁶*Ibid.* July, 35; ⁷*General Practice and Franco-British Med. Rev.* 1932, May 127.

ANKYLOSTOMIASIS.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Further observations on the seasonal variations in hookworm infection in India are recorded by P. A. Maplestone.¹ Working at a large jute mill and in the surrounding villages near Calcutta, he selected an area with an efficient pan-conservancy system, one with a badly supervised pan system, and, thirdly, a village with no conservancy, and he examined stools from each area every month for a year for the number of ankylostome ova present. The highest counts were met with in July and August, during the height of the monsoon. The rate in the area with good conservancy was the lowest of the three, but not to a great extent, owing to the frequency with which the jute-mill workers leave and are replaced by new arrivals from insanitary villages. The lowest rates were in the dry cold weather months of December to February.

The incidence of hookworms in Syria and the Lebanon, where the annual rainfall averages 36 in., is reported on by H. A. Yenikomshian and D. A. Berberian,² working in the University at Beirut. They examined 1700 stools by Kofoid and Barber's brine flotation method and found hookworm ova in 35 per cent of the people around Beirut, and in 70 per cent in the vicinity of Sidon. This is not surprising, as the people use night soil in the cultivation of fruit and vegetables, and most have no latrine accommodation. A few observations in the drier Aleppo and Damascus areas showed a lower rate of infection. Two hundred clinical cases of hookworm disease were treated with a mixture of **Carbon Tetrachloride and Oil of Chenopodium**, and although few worms were removed great improvement in the percentage of hæmoglobin and in general health resulted. They think the disease is increasing in the coastal belt with more extensive banana cultivation.

REFERENCES.—¹*Ind. Jour. Med. Research*, 1932, April, 1145; ²*Trans. Roy. Soc. Trop. Med. and Hyg.*, 1932, March 31, 399.

APPENDICITIS.*A. Rendle Short, M.D., F.R.C.S.*

HISTORY.—Sir W. H. Battle¹ finds that appendicitis and perityphlitis were rather rare diseases at St. Thomas's Hospital until about 1890-5. Also, about the year 1893, the type changed and became more severe. [Some years ago we published figures to the same effect from Bristol.—A. R. S.]

ACUTE APPENDICITIS.

DIAGNOSIS.—A Swedish surgeon, C. Wallerström,² writes on the diagnostic value of Rovsing's symptom. Rovsing taught that if firm pressure is made over the left side of the abdomen, the patient with acute appendicitis will complain of pain in the right iliac fossa. Of 211 cases operated on for acute appendicitis, 70 per cent showed a positive Rovsing sign; in cases of gangrenous appendicitis, 75 per cent. The sign is often positive when other symptoms of appendicitis are absent. It may, however, sometimes be met with in cases that are not appendicitis, but only if the peritoneum is inflamed. It is a sign to distinguish intraperitoneal from extraperitoneal pain. Brittain's sign—retraction of the right testicle when the appendix region is palpated—is favourably reported on by Paul Laroque³ (Virginia). He says that he has observed it present in nearly 500 cases of gangrenous appendicitis, and it was absent in about 300 other acute abdominal conditions. In children the testis retracts easily, and for a variety of reasons, but in that event both retract; in gangrenous appendicitis it is the right only. Alan Lee⁴ (Brisbane) attaches so much importance to the initial epigastric or umbilical pain of an attack of acute appendicitis that he maintains that an emergency operation need not be performed unless there is a clear history that the pain began in that way. Lyman Allen⁵ (Vermont) would have us rely mainly on the leucocyte count

as a guide when to operate. If there are 80 per cent or more of polymorphonuclears, or over 15,000 leucocytes, operate at once; also if the leucocyte count is below 6000. It is safe to wait if the polymorphonuclear count is below 70 per cent and the total count below 15,000.

Appendicitis and Pregnancy.—J. L. Baer, R. Reis, and R. A. Arens⁸ (Chicago) have rendered the appendix visible by barium skiagraphy in seventy pregnant women, and find that it rises after the third month, reaching the level of the iliac crest at the sixth month. About 1.7 per cent cases of appendicitis in women occur during a pregnancy. The appendix should be removed at once.

Operation for Appendicitis.—In May, 1932, at the Annual Oration before the Medical Society of London, Sir James Berry⁷ dropped a bombshell amongst the surgeons by maintaining that "the prevalent surgical treatment of appendicitis, though still holding the position of an idol, is an idol whose pedestal is beginning to totter." He declared that in his young days the great majority of the patients got well without an operation, and compared the satisfactory result in the case of King Edward VII, who had an abscess drained on the tenth day, with the fatality in the case of President Ebert, who had the appendix removed forty-eight hours after the onset of symptoms. He very rightly issued a warning against feeding the patient, giving aperients or enemata, or opening an abscess across the peritoneal cavity instead of through a walled-off area. Sir C. Gordon-Watson⁸ and others replied, and pointed out that in the old days appendicitis was a milder disease; the reason why operation during the early stages of the attack is called for is to remove the dangerous obstructed appendices before they burst with disastrous results. Lord Moynihan wrote that if an aperient has been given, operation is essential.

There was a discussion on the Ochsner-Sherren treatment of later cases of appendicitis at Glasgow, opened by J. Taylor.⁹ Mortalities ranging from 1.5 to 5.7 per cent have been published by Hamilton Bailey, McNeill Love, and others, from various hospitals where the Ochsner-Sherren line of treatment has been adopted. In Glasgow, Taylor reports a death-rate of 5.0 per cent in 67 patients treated expectantly, but in 97 cases operated on from the third day onwards, 14.4 per cent died. In a patient successfully tided over by expectant treatment, one should wait two months before attempting to remove the appendix. [We thoroughly agree.—A. R. S.]

Technique of Operation.—A. W. Sanders¹⁰ (Pretoria), in the course of a long article, says that the muscle-splitting incision is not a good one for the acute case; the right rectus incision is better. He advises the use of a suctor for fluid in the pelvis instead of swabbing it out, and very rightly.

Several writers speak in favour of simple ligation after cutting away the appendix, instead of burying the stump. J. F. Baldwin¹¹ (Ohio) argues that in addition to simplifying the operation it prevents infection, hematoma, and devitalizing of the cæcum. N. Hortolomei¹² (Bucharest) writes to the same effect. [Probably there is not much in it either way, but personally we prefer to bury, having not long ago had to operate for acute intestinal obstruction, due to an adhesion of the bowel to the not-buried stump of an appendix.—A. R. S.]

C. E. Haines¹³ describes a useful manœuvre when the appendix is densely adherent to the cæcum; he shells out the mucosal tube from the seromuscular coat, leaves the latter attached to the cæcum, and removes the mucosa. F. Marchini¹⁴, an Italian surgeon, believes that it is not necessary to drain the appendix area even in the presence of purulent peritonitis.

Statistics.—H. Chitty¹⁵ reviews 700 cases of acute appendicitis operated on by himself, with a death-rate of 5 per cent. He operates at once on all cases, except those seen late, with a localized tumour. In the presence of diffuse

Table I.—ACUTE APPENDICITIS WITHOUT DIFFUSE PERITONITIS (1408 CASES).**A. Immediate Operation (1840 Cases).**

DAY OF ILLNESS	NO. OF CASES	MORTALITY		COMPLICATIONS	
		Cases	Per cent	Cases	Per cent
1st	442	1	0.22	7	1.58
2nd	531	17	3.20	27	5.08
3rd	293	3	1.02	34	11.60
4th	74	2	2.70	6	8.10
Totals ..	1340	23	1.71	74	5.50

B. Analysis of Complications (74 Cases).

COMPLICATED BY	1ST DAY	2ND DAY	3RD DAY	4TH DAY
Residual abscess* ..	5	12	22	3
Subphrenic abscess ..	1	2	2	2
Obstruction	1	3	3	—
General peritonitis ..	—	3	2	1
Pleural effusion ..	—	1	1	—
Pulmonary embolism ..	—	1	—	—
Femoral thrombosis ..	—	3	—	—
Portal pyæmia	—	2	1	—
Empyema	—	—	1	—
Septicæmia	—	—	1	—
Fæcal fistula	—	—	1	—
Totals	7	27	34	6

*Note.—Residual abscess occurred in 4 cases in which a drain was used, and in 33 cases in which the wound was closed without drainage.

C. Summary of Cases of Acute Appendicitis, admitted on First Four Days of Illness; which were not Operated upon (68 Cases).

DAY OF ILLNESS	DIS-CHARGED: NOTHING FURTHER KNOWN	DIS-CHARGED: REMOVAL LATER	WENT WRONG
1st	0	1	0
2nd	3	6	3 developed abscess
3rd	7	11	5 developed abscess: 1 died, 2 had acute attack a month later
4th	10	13	1 developed abscess; 1 died un-operated; 1 died after operation 2 days later; 6 developed acute attack, necessitating operation at intervals of 1, 3, 9, and 12 weeks respectively
Totals	20	31	17

More than 25 per cent go wrong, and 4.4 per cent die.

Table II.—231 CASES ADMITTED WITH DIFFUSE PERITONITIS.

DAY OF ILLNESS	APPENDICECTOMY AND CLOSURE		APPENDICECTOMY AND DRAINAGE		DRAINAGE ONLY		NO OPERATION	
	Recovered	Died	Recovered	Died	Recovered	Died	Recovered	Died
1st ..	9	3	5	0	—	—	—	—
2nd ..	32	7	22	6	—	—	—	—
3rd ..	37	10	38	8	—	3	—	3
4th ..	17	5	18	5	—	1	1	1
Totals	95	25	83	19	—	4	1	4

MORTALITY { Appendicectomy and closure = 20.8 per cent
 { Appendicectomy and drainage = 18.6 per cent

Complications in Diffuse Peritonitis Cases (37 Cases).

COMPLICATED BY		2ND DAY	3RD DAY	4TH DAY
Fæcal fistula ..	..	1	1	—
Pleural effusion ..	..	1	—	—
Residual abscess ..	..	5	13	2
Pulmonary embolism ..	..	1	—	—
Subphrenic abscess ..	..	1	2	—
Femoral thrombosis ..	..	—	1	—
Obstruction ..	..	—	3	1
Empyema ..	..	—	2	1
Abortion ..	..	—	2	—
Totals ..	..	9	24	4

CONCLUSION.—In cases with diffuse peritonitis operated upon in the first four days, the death-rate is 20 per cent, and the percentage of complications is 20.6 per cent.

Table III.—487 CASES ADMITTED WITH PALPABLE MASS.

DAY OF ILLNESS	OPERATION					NO OPERATION				
	Appendicectomy and Drainage		Drainage only			Subsided		Evacuated by Bowel		
	Discharged	Died	Discharged: Nothing further known	Returned for Appendicectomy	Died	Discharged: Nothing further known	Returned for Appendicectomy	Discharged: Nothing further known	Returned for Appendicectomy	Died
2nd ..	9	1	1	1	0	2	2	—	—	—
3rd ..	14	0	2	4	1	13	14	—	—	—
4th ..	10	4	3	8	1	17	27	—	—	1
5th ..	4	1	4	6	0	18	23	—	1	1
6th ..	6	2	3	13	1	15	17	—	—	—
7th ..	1	0	0	10	0	9	17	—	—	—
Over 7th	11	2	14	50	2	48	63	4	6	—
Totals	55	10	27	92	5	122	163	4	7	2

MORTALITY { Appendicectomy and drainage = 15.4 per cent
 { Drainage only = 4.03 per cent | Mortality in subsequent
 { No operation = 0.67 per cent | appendicectomy = Nil.

Complications in Acute Cases admitted with Palpable Mass.

COMPLICATED BY	CASES OPERATED ON	CASES NOT OPERATED ON
Acute attack	7	11
Residual abscess	12	5
Obstruction	5	2
Pulmonary embolism	1	—
Faecal fistula	3	—
Subphrenic abscess	—	1
Femoral thrombosis	—	1
Totals	28*	20†

* Out of a total of 164 cases operated on (= 17.1 per cent.).

† Out of a total of 296 cases not operated on (= 6.76 per cent.).

CONCLUSION.—In 'appendix mass' cases of all stages, cases operated upon give 7.9 per cent mortality and 17.1 per cent complications. Cases not operated upon give 0.68 per cent mortality and 6.76 per cent complications.

Table IV.—COMPARISON OF AN EARLIER WITH A RECENT GROUP OF CASES OF ACUTE APPENDICITIS OPERATED UPON AT ST. THOMAS'S HOSPITAL.

Group A (1894–1903).—433 cases with 182 deaths (42 per cent).

Group B (1920–1929).—1755 cases with 86 deaths (4.9 per cent).

I. EARLY ACUTE CASES :—

A.—13 with no death.

B.—1340 with 23 deaths (1.71 per cent).

II. CASES WITH DIFFUSE PERITONITIS :—

A.—166 with 143 deaths (86.0 per cent).

B.—226 with 48 deaths (21.1 per cent).

III. CASES WITH PALPABLE MASS :—

A.—254 with 39 deaths (15.3 per cent).

B.—189 with 15 deaths (7.95 per cent).

peritonitis, he merely drains under a local anæsthetic or gas-oxygen, and follows up with Ochsner-Sherren treatment.

J. McKenty¹⁶ (Winnipeg) lost 5.9 per cent of 401 cases treated on the principle of immediate operation as the routine treatment.

B. R. Sworn and G. M. Fitzgibbon¹⁷ give statistics of 2126 cases of acute appendicitis from St. Thomas's Hospital, for the years 1920–9. The results are as shown in *Tables I–IV*. Immediate appendicectomy was the regular treatment, except in cases with a tumour mass; these have usually been left, or drained without appendicectomy. The patients were re-admitted for removal of the appendix after an interval, and of these 299 were operated on, and none died. The general mortality was 4.9 per cent; between 1804 and 1903 it was 42 per cent, largely on account of the numerous cases of diffuse peritonitis.

Thrombophlebitis after Appendicitis.—K. G. Ketrakis¹⁸ writes from Göttingen on this subject. He recommends that when rigors are present before or after the appendix is removed, the ilæocolic vein should be tied. He collects from the literature 15 cases of portal pyæmia thus treated, of which 10 were saved.

CHRONIC APPENDICITIS.

According to G. A. Scotti¹⁹ (Florence) a number of surgeons in Italy believe that in cases of chronic appendicitis the pupil of the right eye is often slightly larger than the left. R. McClure²⁰ (Detroit) maintains that pathologists report inflammation of the appendix in many cases where the clinician finds no satisfactory evidence of it, but as almost 18,000 people die of appendicitis in the U.S.A. every year, it is all to the good that abnormal appendices are removed as a prophylactic measure.

F. B. Block²¹ (Philadelphia) argues that chronic appendicitis must be a true pathological condition because in his experience 60 per cent of his 100 cases were cured of their pains, and another 17 per cent were well satisfied with the result. A follow-up of 190 patients operated on at Königsberg, by E. Prass,²² showed 52.4 per cent of the children, 67.7 per cent of the men, and 58.4 per cent of the women quite cured, and a general total of 60 per cent practically well. Many of the others were improved.

REFERENCES.—¹*Lancet*, 1932, i, 1276; ²*Deut. Zeits. f. Chir.* 1932, April, 635; ³*Amer. Jour. Med. Sci.* 1931, Aug., 191; ⁴*Med. Jour. Australia*, 1931, Nov., 636; ⁵*New Eng. Jour. Med.* 1931, Dec., 1105; ⁶*Jour. Amer. Med. Assoc.* 1932, April, 1359; ⁷*Lancet*, 1932, i, 1027; ⁸*Ibid.* 1119; ⁹*Glasgow Med. Jour.* 1932, May, 255; ¹⁰*Jour. Med. Soc. S. Africa*, 1931, Oct., 659; ¹¹*Ann. of Surg.* 1932, May, 704; ¹²*Zentralb. f. Chir.* 1931, Sept., 2379; ¹³*Med. Jour. and Record*, 1931, Dec., 408; ¹⁴*Arch. Ital. d. Chir.* 1931, xxviii, 549; ¹⁵*Bristol Med.-Chir. Jour.* 1931, 167; ¹⁶*Canad. Med. Assoc. Jour.* 1932, Jan., 50; ¹⁷*Brit. Jour. Surg.* 1932, Jan., 410; ¹⁸*Deut. Zeits. f. Chir.* 1931, July, 625; ¹⁹*Polichinico*, 1931, xxiii, 886; ²⁰*Ann. of Surg.* 1931, Aug., 203; ²¹*Med. Jour. and Record*, 1931, Nov., 448; ²²*Deut. Zeits. f. Chir.* 1931, Sept., 767.

ARRHYTHMIA AND ELECTROCARDIOGRAPHY. (See also CORONARY ARTERY DISEASE; HEART, *passim*; MYOCARDIUM, DISEASE OF.)

A. G. Gibson, M.D., F.R.C.P.

Electrocardiography.—K. S. Smith and R. A. Hickling¹ have investigated the electrocardiograms taken during the treatment of twenty *diabetics* of all ages. The most pronounced change was seen in the T wave, which was commonly flattened in Leads I and II, and might be diphasic in Lead III. An increase of amplitude in the T wave was seen in Leads I and II and the substitution of an upright for a diphasic wave in Lead III in two patients. There was an inversion in the T wave in all leads. During treatment there was a gradual disappearance of these abnormalities. The P wave also showed progressive diminution during treatment and a lessening of slurring in the QRS complexes. The authors discuss the possible causes for these abnormalities, and they come to the conclusion that the parenchymatous damage to the heart resulting from defective nutrition is the commonest factor. Coronary disease probably plays a subsidiary part.

R. N. Speckman and M. L. Rich,² as the result of examination of 50 patients showing *electrocardiograms of low voltage*, conclude that the occurrence of a voltage of 5 mm. or less, regardless of other abnormalities in the electrocardiogram, is of serious prognostic importance in a patient with heart disease. Of the 50 patients, 47 gave symptoms referable to the heart; 14 had auricular fibrillation, 10 had aberrant QRS complexes, 9 had heart-block, and 7 had an inverted T wave: 32 patients died within six months of the first electrocardiogram showing low voltage. In 14 necropsies the most conspicuous lesion was fibrosis of the myocardium.

C. C. Wolferth and F. G. Wood³ have employed a *fourth lead*, with the terminals on the sternum and the dorsal spine, in an attempt to get clearer evidence of cardiac infarction than is sometimes found in the electrocardiograms of the three normal leads. They describe two cases with clinical

histories suggestive of cardiac infarction in which the only evidence was a marked depression in the ST interval in Lead IV. In one case this depression had almost disappeared after one month. In twenty normal controls this depression was not present. The features of this lead in the normal are as follows: the P wave is often inverted; the QRS complex tends to be of a higher voltage than in the other leads; the T wave is deep and inverted.

Two cases would not appear to be sufficient to prove the authors' point, especially as both cases recovered and could not therefore be followed to post-mortem, but the method is one which might prove useful.

Heart-block; Ventricular Fibrillation.—J. T. King and D. McEachern⁴ have examined the problem of the recognition of *bundle branch block* without the aid of galvanometric records. They have studied a series of 50 cases; their results show that they were able to make the diagnosis in 85 per cent, and they refer to the experimental observation of Eppinger and Rothberger that an asynchronous contraction of the ventricles can be identified after section of one branch of His's bundle, and the observation by Eppinger and Stoerk that reduplication can be felt at the apex. This study showed that visible apical reduplication could be identified in 84 per cent of the cases, that auscultation reduplication of the first sound at the apex was present in 56 per cent, and synchronous systolic murmurs in 12 per cent. They discuss the differentiation from presystolic gallop rhythm.

S. P. Schwartz⁵ records the study of an example of *transient ventricular fibrillation and complete heart-block*. The patient was a woman, aged 66, weighing 8 stone, whose complaint was a progressive shortness of breath, weakness, and recurring attacks of loss of consciousness. There had been also briefer periods of giddiness and fainting sensations. The lips were cyanotic, and the apex of the heart was in the sixth intercostal space in the anterior axillary line. The first sound at the apex was weak. The pulse was 38 per minute and the blood-pressure 280 max. and 80 min. In a minor attack which was closely observed this pulse suddenly collapsed for a few seconds and no beats were palpable at the wrist. The patient became pale, shut her eyes, shook her head, and then opened her eyes again and sighed deeply. After a few minor seizures the patient became suddenly motionless and dropped into an armchair. Her eyes became fixed, she became deathly pale, with cyanosis of the lips, and then occurred an epileptiform attack, followed by an intense flush of the face with a barely perceptible slow pulse of 45. This lasted a few seconds and was followed by a rapid pulse-rate of 100 per minute. A period of syncope lasted about two minutes, during which time no auricular pulsations were visible in the neck and no pulse could be felt at the wrist. The total number of seizures during a period of observation of seven months was 67. The electrocardiogram showed that each syncopal seizure was associated with ventricular fibrillation, and the longest recorded attack was six minutes. The electrocardiograms taken on numerous occasions showed that preceding a syncopal seizure there was a gradual acceleration of auricular and ventricular rates, the highest ventricular rate being 65 beats per minute. At the onset of the seizure in the recorded examples ventricular fibrillation began with a ventricular extrasystole always of the same character. The ventricular rates varied from 250 to a maximum of 1000 beats per minute. Spontaneous recovery coincided with the cessation of ventricular fibrillation. From the clinical point of view the diagnosis of transient ventricular fibrillation may be suspected if, preceding a period of unconsciousness, the heart-rate increases above the ordinary basic rate for the patient.

H. D. Levine⁶ makes a plea for the employment of **Quinidine Sulphate** in order to inhibit the tendency to fibrillation of the ventricle in cardiac

disease. Fibrillation of the ventricle is regarded as a circus movement similar to fibrillation of the auricles, but its clinical effects are those of syncope. The author refers to Morovitz, who reported in 1929 the successful use of the drug as a prophylactic in patients whom he regarded as liable to sudden death. The figures showed a diminution in the number of sudden deaths under quinidine. Levine's experiments on cats showed that quinidine inhibits the facility with which ventricular fibrillation can be produced by faradic stimulation. There is, therefore, solid reason for the use of this drug against the dangerous symptoms that affect cardiac patients. He refers to two patients. In one, a patient with rheumatic heart disease and auricular fibrillation, in whom syncopal attacks occurred, the heart was restored to normal rhythm; in the other, recurrent attacks of syncope which had continued over a period of eighteen months, presumably due to ventricular fibrillation, were stopped by quinidine.

L. B. Ellis⁷ analyses 43 cases of *complete heart-block*, all of which were proved by the electrocardiogram, from the Boston City Hospital. The ages of the patients were from 9 weeks to 78 years. The chief causes were congenital defects, trauma, acute infections, intoxications as from digitalis, rheumatic fever, syphilis, arteriosclerosis, and tumours. It is frequently impossible, however, to determine clinically the etiology in any particular case. Of 29 cases which showed persistent block, 2 were of congenital origin, one in a child of 9 weeks and the other in a boy of 9 years, who had a slow pulse since birth. Both of these patients had enlarged hearts. In 7 patients under 40 years of age the block was either congenital or had followed some infection. Diphtheria was the probable cause in one person, a woman of 28, in whom a slow pulse was observed to come on during an attack of diphtheria at the age of 4. In 2 patients the cause was rheumatic fever, and in 2 only out of the series was the blood Wassermann reaction positive. Of 7 patients under 40 years of age, with a congenital or undetermined etiology, 4 had no symptoms whatsoever and were leading active lives, and 3 had mild symptoms only. Of the 2 patients with rheumatic infection one had been a chronic cardiac invalid for years, and died thirty months after the discovery of the block. The other had had repeated attacks of congestive heart failure. Twelve patients had heart-block due to arteriosclerotic changes. All of them had cardiac symptoms, slight to moderate in degree. Three of these were living at the time of writing, but the longest period of observation was five years. The pulse-rate varied from 23 to 65 over this series. Cardiac enlargement was absent in 7 cases; in these patients the blood-pressure also was normal. In addition to complete heart-block a number of patients were found to have other abnormalities, auricular fibrillation, intraventricular block, bundle branch block, and inverted or diphasic T waves. Just under half of the patients presented no other abnormality than the heart-block. The blood-pressure may be found normal at any age, though in heart-block after 40 it is more likely to be raised. In a large proportion of these cases of raised blood-pressure the minimum pressure remained little if at all raised. The authors conclude that heart-block should be considered as a sign of cardiac abnormality, which is usually indicative of severe cardiac damage, but not necessarily so.

L. B. Ellis and S. Weiss⁸ have made a careful physiological investigation into the *conditions of the circulation in five cases of complete heart-block* in patients whose ages varied from 33 to 78. The blood-pressure observations are summarized in the previous abstract by L. B. Ellis. In three of the present cases the raised pressure was only evident in the systolic pressure. The vital capacity was normal in one and diminished in two. The cardiac output in 4 cases fell within normal range, and the blood-flow was normal so

long as the patient showed no circulatory failure in bed. The blood volume as estimated by the dye method showed a reduction in the amount of circulating blood. The basal metabolic rate was below the theoretical normal.

The symptoms of patients with heart-block are either those of congestive or anginal heart-failure following myocardial degeneration, or Adams-Stokes' attacks.

J. D. S. Cameron and I. G. W. Hill⁹ report on two cases of *heart-block in toxic goitre*. In the first case, a woman aged 33, fibrillation developed later, and the pulse subsequently returned to normal after nine days. She was four-and-a-half-months pregnant and was admitted for abdominal hysterotomy because of vaginal bleeding. During this period auricular fibrillation was present. The second patient, a woman aged 18 with primary Graves' disease, had an attack of acute tonsillitis; a septic tooth, and later the tonsils and adenoids, were removed. This was followed by a purulent nasal discharge, and four days after the operation heart-block was noticed. There was no improvement under treatment with Lugol's iodine, and seven-eighths of the thyroid gland was removed under gas and oxygen anaesthesia. Following operation there was a return to normal rhythm. In both these cases the development of heart-block followed septic throat infection; in one, three weeks after a sore throat, and in the other, six days after tonsillectomy for a recent tonsillitis. A similar case reported by Eason is quoted, and also the statement of Wenckebach and Winterberg that severe sore throats, especially of streptococcal origin, are liable to cause disturbance in the conducting system. (*See also HEART IN GOITRE.*)

Paroxysmal Tachycardia.—Several papers deal with treatment. J. C. Healy,¹⁰ in a short review, gives the methods that are most likely to be successful. If a patient is seen during the attack, **Vagal Stimulation** sometimes stops it. This is most conveniently applied by pressure on one or both carotid arteries in the neck. The site most efficacious is the carotid sinus in the first part of the external carotid artery. The majority of cases, however, require to be treated in addition by some form of drug. **Quinidine Sulphate** is estimated to produce amelioration or stoppage of the attacks in about ten minutes after intravenous injection of 0.5 grm (8 gr.). The dosage by the mouth should be the same as for auricular fibrillation, starting with 5 gr. for the first day, 10 gr. for the second, 15 gr. for the third day, and gradually increasing. It is seldom necessary to give large doses.

Another drug of the quinine series which gives good results is **Solvochin*** a 25 per cent aqueous solution of quinine, alkaline to litmus, and having a pH concentration similar to the body tissues. It is given intravenously or intramuscularly during the attack in a single dose of 2 c.c., which contains 0.5 grm. (8 gr.) of quinine. P. Sunder Plassmann¹¹ records the case of a woman of 55 who on the day previous during mild exertion in her garden suddenly had violent palpitation and was unable to move from the spot. When seen she was curled up in bed on the right side, the neck veins were distended, the skin was covered with sweat, and she complained of a great sensation of oppression in the chest. The heart-rate was 190 to 220 per minute, and the rhythm was tic-tac. The radial pulse was small, easily compressible, thready, and difficult to count. The urine was diminished, the liver dullness increased, but there was no oedema. An intravenous injection of glucose and strophanthin produced no change. After some time 2 c.c. of **Solvochin** and 0.7 grm. of **Salyrgan** were injected intramuscularly and the

* E. H. Spicer Laboratories, Watford, Herts.

carotid sinus was stimulated. In a short time the patient was rendered more comfortable, the oppression disappeared, and the pulse fell to below 70.

Two other cases of the beneficial effect of solvochin are recorded by G. Wiele.¹³ In the first case a man of 53, who had had acute rheumatism at 19, began to suffer from attacks of paroxysmal tachycardia, with the usual symptoms, the attacks lasting two days. In the attack in which he was seen the heart was dilated on both sides, both hands and feet were cold and blue, and pressure of the vagus was unsuccessful, as were numerous injections, but the attacks appeared to cease of their own accord. After one or two weeks' interval the attacks recurred, and ceased in every instance on an intravenous injection of solvochin; and by the continuance three times daily of 0.25 grm. (4 gr.) of Quinine with small doses of Digitalis the attacks recurred at very long intervals. The second case—a post office worker aged 42, who also showed dilatation of the heart and considerable cardiac insufficiency—had an attack stopped by solvochin, but it recurred in a few hours and was again stopped by a similar injection. Subsequent continuous treatment by quinine and digitalis prevented all but few and slight attacks.

M. Hochrein¹³ records cases in which Atropine has been used with success. The cases in which this remedy appears to be of value are those in which the attacks have no relation to hyperthyroidism or mitral stenosis, and are resistant to quinidine, quinine, and strophanthin. Seventeen cases were investigated between the ages of 19 and 61. In 3 cases the attacks ceased over a period of fifteen years, and in 6 cases five years. In 60 per cent conduction between auricle and ventricle was delayed, and in 40 per cent there was splitting of the P wave. Atropine was given by the mouth in increasing doses until the patient complained of dryness of the tongue and throat. The action is seen in three to five days after the beginning of treatment, which is continued for fourteen days afterwards, and it may be necessary to continue the drug in modified doses.

C. Oestreich¹⁴ records a case in which by the exhibition of atropine the patient was made much worse, but in this case, a woman of 49, she had suffered from hyperthyroidism. The attacks were ultimately controlled by continuous Quinidine medication of 0.2 grm. (3 gr.) five times daily.

REFERENCES.—¹*Lancet*, 1932, i, 501; ²*Abstr. in. Jour. Amer. Med. Assoc.* 1932, Feb. 6, 510; ³*Amer. Jour. Med. Sci.* 1932, Jan., 30; ⁴*Ibid.* April, 445; ⁵*Arch. of Internal Med.* 1932, Feb., 282; ⁶*Ibid.* May, 808; ⁷*Amer. Jour. Med. Sci.* 1932, Feb., 225; ⁸*Ibid.* 1931, Aug., 195; ⁹*Edin. Med. Jour.* 1932, Jan., 37; ¹⁰*New Eng. Jour. Med.* 1931, Nov. 19, 1010; ¹¹*Munch. med. Woch.* 1931, Aug. 14, 1399; ¹²*Ibid.* 1932, April 8, 58; ¹³*Ibid.* 1931, Dec. 4, 2070; ¹⁴*Ibid.* 1932, Jan. 29, 192.

ARTERIOGRAPHY.

A. G. Gibson, M.D., F.R.C.P.

Three papers deal with the delimitation of the arteries in the living body by X rays (H. E. Pearse and S. L. Warren,¹ R. dos Santos, C. Lamas, and P. Caldas,² and T. Wohlleben³). The substances used to find a suitable medium for injection have been uroselectan, abrodil, and thorotrast, the last of which is used for the delimitation of the spleen. Another that appears suitable in the hands of Pearse and Warren is sodium-mono-iodo-methane sulphionate, which is sold as 'Skiodan' by the Winthrop Chemical Company of America. This drug is used in a 40 per cent solution, and 20 grm. are necessary for an experiment. Experiments on dogs' arteries showed that there was no harmful effect on the endothelium after five minutes' exposure to the drug. A solution is made in freshly distilled water, distilled over from glass, filtered, and sterilized by boiling. Pearse and Warren found that in respect of the lower limb it was best to expose the femoral artery in Hunter's canal and to separate it by preliminary dissection from the vein and nerve. The operation is done

so as to allow the X-ray photograph to be taken as soon as the injection is made. The artery is compressed between thumb and finger by raising it from its bed with a tape and the vessel wall punctured obliquely by a No. 20 gauge needle, to which is attached a syringe of 50 c.c. containing the solution. After 25 c.c. have been injected the film is exposed while the solution is being forced into the artery. The injection is then stopped temporarily while the film is being changed, and after an additional 20 c.c. have been injected the second exposure is made while the last 5 c.c. of the solution are forced in. The whole time taken should not be more than ninety seconds. There is practically no bleeding on withdrawal of the needle, and no sutures are necessary for the artery.

Observations on the arteries in two cases in which amputation was done after the injection showed no detrimental effect on the intima and no thrombosis. The conditions in which this procedure is valuable are those of obliterative arterial disease, aneurysm, arteriovenous communications, and deep phlebitis. It is also useful in delimiting and estimating the progress of treatment of tumours of the limbs not otherwise amenable to surgical treatment.

REFERENCES.—¹*Ann. of Surg.* 1931, Dec., 1094; ²*Bull. et Mém. Soc. nat. de Chir.* 1932, May 7, 635; ³*Deut. Zeits. f. Chir.* 1932, April, 207.

ARTERIOVENOUS ANEURYSM. (See ANEURYSM, ARTERIOVENOUS.)

ARTHRITIS. (See RHEUMATISM AND ARTHRITIS.)

ASPHYXIA. (See RESUSCITATION FROM ASPHYXIA.)

ASTHMA.

W. H. Wynn, M.D., F.R.C.P.

In spite of much active investigation from both the clinical and laboratory sides, no material advance has been made in our knowledge of asthma. Conflicting opinions are expressed on such questions as allergy and the skin reactions, heredity, acidosis and alkalosis, the significance of proteose in the urine, and the value of specific and non-specific methods of treatment, and little of real value emerges.

J. Adam¹ insists upon the importance of eosinophilia in the diagnosis of asthma. Dyspnoea without eosinophilia should always raise suspicion as to the diagnosis. Wheeze plus eosinophilia is asthma; wheeze plus tough viscid sputum crowded with eosinophils is asthma; wheeze plus purulent sputum with few eosinophils but with many polymorphonuclears is not simple asthma. A survey of 1500 cases showed that increase of eosinophils in the blood beyond 4 per cent was the rule (on an average 8·4 per cent in 68·5 per cent of the cases). Of the remaining 31·5 per cent three-quarters had no asthma at the time of the count, so that, correlating count with wheeze, eosinophilia was found in 80 per cent. Eosinophil counts of over 20 per cent were not uncommon. The highest found was 68 per cent. The fall in the count is good indication of improvement. A patient free from wheeze but with a high count is a candidate for a fresh attack. The count may vary quickly. It mostly rises before and falls after the attack; in menstrual asthma it rises before and falls after the flow. It rises within one hour after ingestion of urea and may even be doubled. It falls within ten minutes of an injection of adrenalin and rises with a hot bath, but may fall if this is followed by a cold douche. These are general statements with exceptions and do not apply when the count is nearly normal. A small number of genuine asthmatics have eosinopenia. These are mostly hypopietics. The blood-pressure in most cases of asthma is normal. But there are both hypo- and hyperpietic cases; both wheeze on exertion because of the

narrow threshold with which to meet strain and the tendency to pulmonary congestion. The view that asthma is associated with alkalosis has gained ground of recent years, but Adam maintains that there is an acidotic tendency. Estimation of the alkali reserve has shown it to be at the lower normal limit or below especially during an attack. With improvement from treatment the alkali reserve rose and the eosinophils fell, the contrary being the case if asthma recurred. A family history of asthma or its allies was found in only 26 per cent, and the author does not agree that heredity in the ordinary sense of the word is of importance. Three cases are recorded in which the adrenal glands showed marked changes. In a woman of 41, asthmatic for nine years, and an adrenalin addict, who had injected 7 oz. in one week and 1 oz. in one night, necropsy showed that the adrenal medulla was almost wholly destroyed, being reduced to a mere rim around a central cavity. In the other two cases the adrenal medulla was mainly replaced by caseous masses containing giant cells, but no tubercle bacilli were found. The adrenal cortex was also abnormal.

A. H. Fineman² describes a 'pressure test' for asthma. Normally manual pressure on the chest during expiration provokes no adventitious sounds, but in asthmatics prolonged high-pitched sibilant rhonchi are produced. In emphysema and bronchiectasis the test is negative unless there is associated asthma. In chronic bronchitis only coarse sonorous rhonchi are heard. A negative test does not exclude asthma, but a positive test is of diagnostic importance.

L. H. Crip³ has made a complete cardiovascular study of 50 asthmatics and an electrocardiographic study in 8 cases during acute attacks. He finds that asthma does not have a permanent damaging effect upon the cardiovascular system, but that acute attacks as a result of the associated asphyxia produce minor transitory disturbances in cardiac conduction.

J. Harkavy and S. Hebal⁴, in a study of asthma due to hypersensitiveness to infection, observed 9 cases in which arthritis developed. The arthritis was migratory, affecting various small and large joints, and was accompanied by redness, swelling, and pain on movement, but practically no fever. The duration of the arthritis was from two to four years, whereas that of the asthma was from six to fifty years. In five of the patients, foci of infection in sinuses and lungs constituted the only etiological factors of the asthma and arthritis. In four, besides infection there was a coexistent hypersensitiveness to substances such as ragweed, goose feathers, etc. Simple elimination of these substances had no influence upon the asthma or arthritis. Evacuation of pus from antrums, treatment of ethmoids, and the consequent recession of the pulmonary focus caused complete subsidence of the arthritis in 8 of the 9 cases, while the asthmatic seizures diminished in frequency and severity in each case. A consideration of recent accumulating evidence of bacterial allergy accompanying infectious conditions such as scarlet fever, rheumatic fever and its arthritis, tuberculosis, etc., led to the conclusion that the allergic state is part of the immunological mechanism accompanying infection. The coexistent arthritis in these cases was regarded as an expression of a similar reaction to that causing the asthma in allergic persons in whom the lungs were the primary and the joints the secondary shock tissues. Similar clinical pictures are seen with such conditions as serum sickness.

H. H. Moll⁵, in the course of an investigation on the effect of liver therapy in asthma, has noted that polycythemia is frequently found in cases of true spasmodic asthma. In 38 cases, counts of over 6,000,000 red cells were recorded in 31 cases, not infrequently the red-cell count was over 7,000,000, in 2 cases it was over 8,000,000, and in one of these the highest figure was 8,750,000. It was also noted that the polycythemia was of an oscillating character and

that the red count might vary 1,000,000 to 2,500,000 at different times. The hæmoglobin percentage did not follow the rise in the red-cell count at all closely, and usually the colour index was below 1. Symptoms of polycythæmia were absent, and although some had a 'high colour' or cyanosis this was not a constant feature, and cases with definite emphysema and marked cyanosis often presented a normal or low normal count. Splenomegaly was only observed once in a case which was exceptional in other respects. There was no reticulocytosis, and no immature red cells were seen. Polycythæmia was found both in recent cases and in those of several years' standing; in about half the cases the duration of the disease was under ten years. In one case a count of 8,000,000 was made three weeks after the first attack the patient had ever had. Analysis of polycythæmia among the different types showed that it was more frequently found in the allergic type. High red-cell counts were usually found immediately after an attack and for varying periods up to one month after an attack, whereas for varying periods of freedom over one month the count tended to fall to normal. High counts were also found in cases with constant wheeziness or frequent minor attacks. These variations were especially marked in the seasonal types of asthma, such as those due to pollen. The relation of the polycythæmia to the attacks suggest that it is due to the stimulative effect of anoxæmia. The polycythæmia appears to be a relative one and a condition in which the volume of the individual cell is decreased, and there is consequently an increased number of cells for each cubic millimetre without increase in the total cell volume of blood volume.

P. J. Cammidge⁶ made very exhaustive analyses of the *blood, urine, and feces* in two asthmatics—a man of 44 and a woman of 43. Both patients showed an identical increase in the non-protein nitrogen, uric acid, and nucleotide nitrogen, and a urea nitrogen which was up to the normal limit, but there was no excess of amino-acid nitrogen and the van den Bergh reaction was negative. An abnormal percentage of acetone was found in both, but it was considerably higher in a specimen taken during a paroxysm. Both cases showed a low calcium and an excess of phosphorus. The outstanding features were: (1) The fasting hypoglycæmia with a relative hyperglycæmia after 50 grm. of glucose; and (2) The high carbon-dioxide tension of the alveolar air, pointing to a well-marked alkalosis. This supports Beckman's theory that there is an intimate connection between the state of allergy and the acid-base balance of the body, the allergic individual being, according to him, "one who stores too much reserve alkali and neutralizes too rapidly or too effectively the acid substances constantly liberated into the blood-stream during the course of normal metabolism." It is suggested that the hypoglycæmia in these cases is an inherited defect of metabolism and that this defect is in some way connected with the allergic condition and that the reason why asthma did not appear until middle life was related to defective functioning of the liver. The presence of indol and skatol in marked excess in the urine in both cases and the presence of glycuronic acid in the woman points to an intestinal toxæmia, while the pronounced urobilinuria with the high trypsin index and low percentage of fat in the stools suggests an infection of the bile and pancreatic ducts with consequent secondary changes in the liver and pancreas. The indications for treatment were, first, to improve the condition of the intestine and control the toxæmia; secondly, to raise the sugar content of the blood and increase the functional activity of the liver; and thirdly, to prevent the development of alkalosis. A Diet was prescribed as free as possible from irritating material and containing an excess of acid-forming material. The patients were advised to eat as much **Dextrinized Starch** as possible and to take 2 or 3 oz. of **Glucose** a day. As the administration of calcium along with glucose has a more

beneficial effect than glucose alone in experimental liver poisoning, and as the blood showed a low calcium, **Calcium Lactate** was given in 5-gr. doses three times a day in a paraffin emulsion which also contained **Sodium Benzoate** as a mild antiseptic. Finally, with a view to controlling the increase in alkalosis after meals, **Ammonium Chloride** in 15-gr. doses three times a day was prescribed. The results have so far been good, the female patient being free from attacks since treatment began, and the male patient having fewer and less severe attacks.

TREATMENT.—H. B. Cohen and J. A. Rudolph⁷ discuss the *use and abuse of drugs* in asthma. **Epinephrine** acts by stimulation of the peripheral end organs of the sympathetic. It is poorly absorbed from mucous membranes and slowly absorbed after intramuscular or subcutaneous injection, but has an immediate effect when injected intravenously. The action is of short duration as it quickly leaves the blood-stream and is oxidized. Solutions are unstable unless a preservative is added. Within from five to fifteen minutes after subcutaneous injection of a suitable dose a paroxysm begins to subside, and has usually disappeared within thirty minutes. The effect lasts for from thirty minutes to two hours. The therapeutically active amount is very small. Most text-books give the dose as from 0.5 to 1.0 c.c., and many physicians give 1.0 c.c. of the 1-1000 solution as a routine. Such doses are very dangerous; they cause attacks of palpitation, cardiac irregularity, intense throbbing headache, vomiting, excitability, tremor, blanching of the skin, and extreme weakness. It is a safe rule to give from 0.2 to 0.4 c.c. (3 to 6 min.) subcutaneously. If the attack does not subside in a few minutes, the dose should be repeated in twenty minutes. Patients having severe attacks will have a recurrence of symptoms in a few hours. For these it is well to observe the frequency of recurrence and to administer a dose just before the next attack begins or on its inception. Often the administration of 3 or 4 min. every three or four hours day and night will prevent symptoms completely. For this reason patients should be taught to inject themselves. The solution must be clear and colourless. The slightest tinge of pink indicates that some potency is lost and when there is obvious pink the solution is useless. This explains why poor results are often obtained and why doses of 1 c.c. are so often given without dangerous reactions.

Ephedrine has similar effects to epinephrine upon the sympathetic system but its effect is more lasting. It is readily absorbed from the alimentary canal and the full therapeutic effect can be obtained by oral administration. Except in rare instances a full therapeutic dose will not relieve a severe paroxysm. It is helpful in continuous doses in preventing mild attacks, and it does control the wheezing of the mild asthmatic state. It is best administered as the hydrochloride or sulphate in doses of from 25 to 65 mgrm. The effect lasts from four to six hours. It is poorly tolerated by most patients; it produces wakefulness, bad dreams during sleep, marked weakness, nausea, sweating, and in some patients cardiac irregularity. The cerebral symptoms can be controlled by administering a small dose of some hypnotic with each dose of ephedrine, e.g., 5 to 10 mgrm. of **Amytal** with each 50 mgrm. of ephedrine hydrochloride. This dose can be given four times a day, evenly spaced between the hours of rising and retiring. Extra doses are useless if an attack supervenes, and epinephrine should then be given. Ephedrine is soluble in oils and a 1 per cent solution in oil is useful for nasal use in hay fever.

Morphine is used to dull the excitement and fears of the patient and because it is supposed to produce bronchiolar relaxation. But its effect on the bronchiolar muscles is by no means constant, and narrowing of their lumen may follow its administration. *Clinical experience shows that its use in asthma*

is dangerous. Hyde Salter long ago expressed his great objection to opium in asthma and had often seen it do harm. Death in an acute attack of asthma is rare, but the writers have seen it in six cases. In five, death followed within a few hours after the administration of morphine, and in one case following the use of codeine. In none of the patients was there any evidence of cardiac or other organic condition sufficient to cause death. In all there was an increase of the asthmatic symptoms following the drug; respiration became progressively more laboured, and the patients died respiratory deaths quite comparable to those seen in strangulation. In two cases examined post mortem the entire bronchial tree was filled with mucous exudate so tenacious that it was difficult to separate it from the bronchial wall. There are several possible explanations for these bad effects: morphine depresses the respiratory centre and makes the respiration more shallow; the cough reflex is abolished and makes it more difficult to expel the mucous plugs from the bronchial tree; and opiates are themselves able to produce urticarial-like swellings. Morphine, codeine, and other opium derivatives produce wheals when injected into the skin. Many patients have itching following hypodermic injection. It is quite possible that in those asthmatics with an idiosyncrasy to opium there is produced a swelling in the bronchi which is added to the reaction already present. That opiates are contra-indicated in asthma cannot be doubted by anyone with sufficient experience of the disease.

The effects of **Belladonna**, **Stramonium**, and **Hyoscyamus** depend upon their atropine content. **Atropine** paralyses the innervation of the bronchial muscles and glands, causing bronchial dilatation and lessened secretion. The best effects are obtained when the drug is inhaled. This can be best accomplished by inhaling the smoke produced by burning a powder composed of 1 gm. of **Stramonium** and 2 gm. of **Potassium Nitrate**. The smoke of 1 gm. of stramonium leaves is said to contain 0.3 to 0.5 mgrm. of atropine. The inhalation of these smokes is soon followed by cough and expectoration of the mucous plugs. In some patients the relief is prompt and satisfactory; in others apparently similar no relief is obtained. Atropine is not nearly so useful when administered by other routes, since it is necessary often to give toxic amounts to relieve an attack, and this can be done much better by epinephrine.

Iodides, **Lobelia**, and **Tobacco** assist in the relief of mild paroxysms of asthma by their thinning effect on the bronchial mucus. Iodides are excreted directly in the bronchial mucus; tobacco and lobelia produce thinning by their nauseating effect. Iodides are of use between paroxysms, particularly in patients with secondary bronchitis. **Calcium** has been used because of its alleged anti-ardemic effect, but this action cannot be demonstrated experimentally, and many authors report no clinical effect. It should be omitted from the list of remedies for asthma, since it will not relieve an acute attack and has no influence on the recurrence of attacks.

T. Nelson and A. D. Porter,⁸ influenced by the good results claimed for high dilutions of **Tuberculin** in the treatment of asthma, have tried dilutions of simple broth. They used 'Tabloid Broth' as sold for the preparation of culture media. One tabloid was dissolved in 5 c.c. of water and sterilized by boiling. Various dilutions were made of this. The dilutions ranged from 1-100,000 to 1-100,000,000; 1-1,000,000 was an average dilution for starting treatment, 0.1 c.c. of this dilution being a usual initial dose. Weekly doses were given, and they had no doubt that there was a marked effect on the course of the attacks. In slight cases the effect was often immediate and dramatic. Once the right dose was obtained it was found difficult to increase it or the intervals. In slight cases the dose might be very slightly increased and the intervals very

slowly lengthened. The chief difficulty was to find the right dose for a given patient. If the weekly dose of protein was discontinued within anything less than six months to a year the attacks tended to recur and were sometimes as bad as before treatment was given. The patients chosen were those who had severe asthma and had been resistant to other methods of treatment. In order of difficulty of treatment it was found that the bacterial type was the most resistant, followed by food-, hair-, and pollen-sensitive cases. Their series is too small for statistical treatment, but roughly 40 per cent were markedly benefited, 35 per cent improved, and 24 per cent slightly affected. The authors do not make claims for the method to be regarded as a special form of treatment, but rather as an interesting experimental fact that a small amount of foreign protein introduced periodically under the skin will over a certain short space of time maintain a person in a state of reduced susceptibility to his allergic spasm.

H. H. Moll⁶ has used **Liver Extract** in 53 cases of asthma. In the majority liver extract (Armour) was administered in the dose of 1 to 1½ oz. a day for several months. Usually a period of three months was required before the full beneficial result was seen: 32 cases were improved and 21 failed. The best results were obtained in allergic cases. Of the cases that failed, some were made definitely worse, either because the extract caused gastric disturbance or because it was definitely asthmogenic.

REFERENCES.—¹*Brit. Med. Jour.* 1932, May 28, 973; *Glasgow Med. Jour.* 1931, Aug., 83; ²*Med. Jour. and Record*, 1932, May 4, 425; ³*Arch. of Internal Med.* 1932, Feb., 241; ⁴*Ibid.* April, 698; ⁵*Brit. Med. Jour.* 1932, i, 976; ⁶*Lancet*, 1931, ii, 1070; ⁷*Jour. Amer. Med. Assoc.* 1932, May 28, 1864; ⁸*Lancet*, 1931, ii, 1342.

ASTHMA: SURGICAL TREATMENT.

A. Tudor Edwards, M.Ch., F.R.C.S.

The success resulting from operations upon the vegetative nervous system in many conditions of spasm, such as is found in Raynaud's disease in the limbs, Hirschsprung's disease of the colon, and certain spastic conditions of the limb musculature, has led to attempts to treat asthma on similar lines.

V. Romankevich¹ has made an exhaustive study of the anatomy of the pulmonary divisions of the vagus and bronchial plexus. He states that bronchial divisions from the vagus consist of three or four anterior branches and five or six posterior branches. The anterior branches arise below the recurrent laryngeal nerve and there is a crossing over of fibres to the opposite side. Two types of structure of the posterior bronchial nerve plexuses were noted—a large compact unit and a fine scattered arrangement. The former is more characteristic of that found on the left side, the latter of that on the right side. The author is of opinion that the theoretical possibility of complete denervation of the lung would seem to be practical, and this should be performed through the posterior extrapleural route by a three-stage operation.

O. Dolainski² considers that the exact point of surgical attack, whether vagus or sympathetic, is by no means settled. In fact, many observers cannot be convinced that the vagus alone carries the broncho-constrictor fibres, and thus operations have been performed on both vagus and sympathetic, with a consequent high proportion (47.5 per cent) of failures. This report suggests that sympathectomy for bronchial asthma is still to be regarded as a very uncertain measure, but, because of its relative safety and the results occasionally obtainable, should not be abandoned.

REFERENCES.—¹*Deut. Zeits. f. Chir.* 1931, July 8, 231; ²*Mitteil. a. d. Grenzgeb. d. Med. u. Chir.* 1931, xlii, 295.

BERI-BERI.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

N. Bernard,¹ in a discussion on the etiology of beri-beri, thinks that it is a toxico-infectious disease which has been confused with other conditions, and that the acute cases are distinct from the condition due to lack of vitamin B, while the chronic paralytic cases are a sequel to the primary toxico-infectious stage. The *B. asthenogenes*, described by him as predominating in the intestinal flora in the initial stages, is not the direct cause of the disease, but it multiplies when there is an excess of carbohydrate diet, with fermentation and production of toxins in the presence of decreased organic resistance caused by an unfavourable dietary regimen, including lack of vitamin B.

REFERENCE.—*Ann. de l'Inst. Pasteur*, 1931, Nov., 508.

BILE-PASSAGES, SURGERY OF. (*See GALL-BLADDER AND BILE-PASSAGES.*)**BILHARZIASIS.** (*See SCHISTOSOMIASIS.*)**BIRTH INJURIES IN NEWBORN.** (*See NEWBORN, BIRTH INJURIES IN.*)**BLADDER, SURGERY OF.***Hamilton Bailey, F.R.C.S.*

An Historical Lithotomy.—Sir D'Arcy Power¹ reminds us that Mr. Samuel Pepys was cut for stone by Thomas Hollyer in 1658—that is, two years before the diarist started his incomparable classic. The operation was successful, but the vasa were damaged, producing sterility but not impotence.

Liquid Paraffin as a Cystoscopic Medium.—Clear liquid paraffin is sterilized in an autoclave and allowed to stand for about thirty-six hours, during which time it regains its crystal clearness. Before use it is heated to body temperature. The cystoscope is passed and the bladder irrigated with boric solution until clear. Through the cystoscope the bladder is then drained as completely as possible. From 150 to 250 c.c. of warm paraffin is then injected through the cystoscope into the bladder. Since water, blood, and pus do not mix with oil, the medium does not become contaminated. The reflection of light from the bladder is improved and the lens never becomes covered with debris. Paraffin is an exceptionally good medium in which to carry out fulguration. It exercises a haemostatic influence and renders visible bleeding tumours which otherwise, on account of the bleeding, would not be seen or of which only a fleeting view would be obtained. (B. E. Greenberg.²)

Pneumocystograms.—G. E. Pfahler³ finds that pneumocystograms are valuable in the exact diagnosis of bladder tumours.

A New Cystographic Medium.—An 8 per cent solution of alkaline bismuthyl tartrate is inexpensive, non-irritating, will flow through the finest catheter, and throws an excellent radiographic shadow. (A. E. Osterberg and G. J. Thompson.⁴)

Diverticula of the Bladder.—Most diverticula are acquired. They occur at a point of congenital weakness, viz. near the ureteric orifices. The ureter rarely empties into the diverticulum. The symptoms are mostly due to the concomitant and inevitable infection. A stereoscopic cystogram or a radiograph of a catheter coiled up in the diverticulum are both useful methods of investigation. Lateral X-rays are almost essential. Three types of operation are practised according to the relative adherence to neighbouring structures:—

Method 1.—Cases with no adhesions. The circumference of the diverticulum is isolated extraperitoneally, the bladder being full; then, after the bladder is emptied, the diverticulum, including a cuff of the neighbouring bladder wall, is circumsised. The hole is closed in two layers and the bladder kept empty.

Method 2.—Cases with moderate adhesions. The bladder is opened, and the orifice of the diverticulum stretched so as to admit a finger (*Fig. 6*). With the finger in the diverticulum the adhesions are separated from without. Once free, the operation proceeds as above.

Method 3.—Dense adhesions. The bladder is opened, and from the suprapubic incision the whole thickness of the bladder wall is divided to the mouth of the diverticulum. It is sometimes necessary to incise the sac wall along its long axis. After removing the diverticulum the bladder is repaired. (J. S. Eisenstaedt and T. G. McDougall⁸ and J. C. O'Day.⁹)

Value of Neurosurgery in Partial Paralysis of the Bladder.—If the 'emptying nerves' (parasympathetic) of the bladder

are not functioning correctly, the sympathetic fibres overact and incomplete emptying of the organ results. Excision of the presacral nerve improves bladder tone. Out of 5 patients in whom sympathectomy was performed for partial vesical paralysis, 2 were cured, and in the remaining 3 the expulsive power of the bladder was improved. (J. R. Learmonth^{7, 8}).

Retention of Urine.—In cases of severe renal damage with retention of urine the bladder must be emptied very slowly. The rate of emptying can only be determined by carefully watching the patient. If too rapid, he becomes more drowsy, nauseated, and dry, and in such cases it is advisable to replace some of the lost urine by injecting saline into the bladder. A week or more may be necessary to empty the bladder. (T. J. Hoskin.⁹)

E. Brecher and R. Chwaller's¹⁰ views are heterodox; as a result of a study of 300 cases observed at Kroiss's clinic in Vienna, they question the inadvisability of completely emptying the distended bladder at one sitting in cases of retention of urine. They believe that the fundamental danger in cases of retention is infection, and that infection is less likely to occur when the bladder is evacuated at the first sitting than when it is decompressed slowly. Attention to asepsis, the administration of large amounts of fluids, and cardiac tonics are the essentials to success in the management of these cases. [Sometimes complete anuria follows catastrophic catheterization or open suprapubic cystostomy. This is a very real danger.—H. B.]

H. Bayle and A. Bocquentin¹¹ draw attention to the danger of the classical suprapubic puncture in the case of a bladder distended with infected urine. They have seen recently two prevesical phlegmons due to this cause. If suprapubic puncture is deemed advisable, a very fine needle such as a lumbar puncture needle should be employed, and it is advisable to empty the bladder as completely as possible.

Suprapubic Cystostomy.—Prevesical cellulitis and suppuration following suprapubic cystostomy are responsible for a large number of deaths following this operation. Many of them can be prevented by the use of Kidd's suprapubic perforator and introducer (*Fig. 7*). Under local anæsthesia the bladder is exposed through an incision of sufficient length for the bladder wall to be seen clearly. A winged catheter is inserted into the distended bladder by means of this apparatus (*Figs. 8, 9*). The great advantages of the method are that there is no escape of urine into the prevesical space and that the



Fig. 6. Dissection of a moderate-sized diverticulum of the bladder is facilitated by the index finger within. (After O'Day.)

bladder can be decompressed slowly. The technique has received the approbation of American and Continental surgeons and is now being adopted widely. (V. Vermooten,¹² O. S. Lowsley and T. J. Kirwin.¹³)

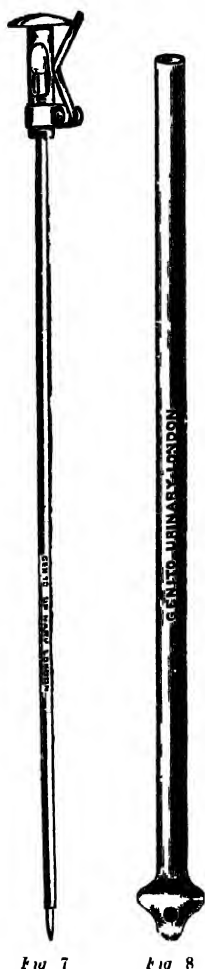


Fig 7

Fig 8



Fig 9

Fig 7 Kidney syringe and De Pezzer introducer

Fig 8 De Pezzer's catheter

Fig 9 Intraluminal De Pezzer catheter suprapubically with Kill's apparatus

Persistent Sinus.—For persistent sinus following suprapubic cystostomy due to adhesions between the bladder and the abdominal wall, Kenneth Walker¹⁴ advises that the bladder be dissected away, not only from the suprapubic scar, but also from the os pubis. After carefully inspecting the interior to make sure that there is no obstruction at the outlet, the bladder is closed completely and a catheter tied into the urethra.

The Transverse Bladder Incision.—H. A. Morton¹⁵ has found that for open suprapubic cystostomy, transverse incision into the bladder wall is better than the usual vertical incision.

For operating upon tumours of the bladder, G. T. LaRoque¹⁶ uses a transverse incision. The skin, muscles, and fascia are divided transversally, the recta being separated longitudinally and held apart by retractors. The

peritoneum is then opened deliberately in a transverse direction. With the bladder caught at its top by forceps and pulled upwards, another transverse incision is made through the peritoneal covering of the bladder at a point about 2 in. below its highest attachment. By gauze dissection the peritoneal covering can now be brushed down with surprising ease, so that the entire bladder is extraperitonealized, and the rectum, ureters, and large vessels are brought into view. The peritoneal cavity is then very accurately apposed by

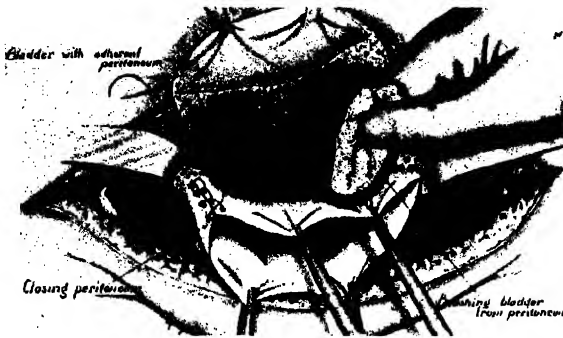


Fig. 10.—LaRoque's method of exposing the fundus of the bladder to full view.
(By kind permission of 'Surgery, Gynecology and Obstetrics'.)

sutures (Fig. 10), after which the now extremely accessible posterior surface of the bladder is in full view and the operation of partial cystectomy is thereby considerably facilitated. A point of great interest is that the peritoneum is intimately adherent only for 2 in. over the fundus of the bladder, and by using this technique, this intimately adherent portion remains attached to the bladder, as can be seen in Fig. 10.

Drainage of Urine from the Cystostomy Wound by Suction.—J. B. Macalpine¹⁷ condemns the Hamilton Irving box, which has been used extensively for so many years. This apparatus is fundamentally unclean, and even when well managed there must always be a pool of stagnant urine on the abdominal wall within the box. Drainage by suction is far better in every way. The danger of suction is damage to the bladder mucosa. Suction requires special apparatus. A variety of pumps are described in the article—from the small electric suction pump for use in nursing homes, to the more elaborate apparatus for the hospital ward. What, unfortunately, is even more difficult to obtain, if the method is to become widely used, are the services of a nurse to dip the glass tube connected to the suction apparatus into the bladder every quarter of an hour, and thus keep the patient's abdominal wall entirely dry. Macalpine explains that the manœuvre only takes five seconds, and in reality the nursing staff find it economical, for in the long run they save the time and trouble of changing wet bedclothes, etc. Suction greatly enhances convalescence and adds to the comfort of the patient. When it is properly employed, a suppurating suprapubic wound is a thing of the past. H. B. Devine's¹⁸ apparatus allows continuous aspiration of the bladder. The suction is provided by a water pump connected to the ordinary domestic water tap.

Cystitis.—For the alleviation of pain in cystitis B. L. Greenberg and M. L. Brodny¹⁹ recommend that 4 oz. of sterile **Liquid Paraffin** be injected by a syringe through a catheter and left in the bladder. The incrustations of alkaline cystitis are floated off easily by the paraffin. Paraffin is especially

useful in tuberculous cases. Normally some of the paraffin is retained in the bladder for as long as five to seven days, during which time its soothing effect is exercised.

Vesico-intestinal Fistula.—The commonest causes of an acquired vesico-intestinal fistula are diverticulitis and carcinoma of the sigmoid colon. The apparent frequency of diverticulitis as a cause is probably due to the tendency to report such cases when operation has been successful. (J. F. Dobson and P. J. Moir.²⁰)

Bilharziasis of the Bladder.—In most cases the lesion is limited to the trigone and the region of the ureteric orifices. Calcification is common, and leads to the formation of the so-called sandy patches of the bladder.

Bilharzial papilloma is usually sessile, and in colour and appearance somewhat like a strawberry. Difficulty in micturition leads to hypertrophy of the bladder wall. Bilharziasis predisposes to stone formation and accounts to a certain extent for the prevalence of vesical calculi in Egypt. In early cases repeated doses of **Tartar Emetic** or **Foadin**, by killing the parasite and its ova, are of inestimable value, but such treatment has no effect upon established chronic bladder lesions. A carcinomatous change occurs only too often in untreated cases. It is only by repeated cystoscopy and removal of the papillomatous masses, by diathermy or other means, that the scourge of vesical carcinoma from bilharzial infection can be kept at bay. (N. Nakar.²¹)

Bladder Tumours.—There has been a tremendous volume of literature upon the treatment of neoplasms of the bladder this year.²²⁻³⁰ The majority of the communications deal with the more serious growths—large malignant papillomata and carcinomata. Various exponents give their experience with diathermy, partial and total cystectomy, radium, and deep X rays. In France, **Diathermy** is employed more frequently than radium. In America, **Radium** appears to be popular. Bompert urges that the indications for total **Cystectomy** in cases of vesical carcinoma should be extended and that the operation should be carried out sooner after the diagnosis has been made.

The pain of inoperable bladder growths causes intense suffering. "When thou takest me, do not take me through my bladder" was part of the evening prayer of an old surgeon living in London. Kenneth Walker,²² who makes this quotation, has found **Radium** worse than useless in these cases, and Professor Marion expresses much the same view in another communication. Nitch finds that transplantation of the ureters is without value in inoperable cases.

Resection of the Presacral Nerve is on trial, and gives promise of affording considerable relief in intractable vesical pain. Learmonth^{23, 30} cites 11 cases in which sympathectomy was performed. In 7 the presacral nerve was excised, with excellent results in 4. In the remaining cases the sacral rami and lateral sympathetic chains were divided in addition, and three patients benefited considerably. When other means have failed **Chordotomy** (laminectomy and section of the spinothalamic tracts) will bring relief (Grant).²⁹

Vesical Calculus.—Litholapaxy is notoriously unsatisfactory when the prostate is enlarged. If suprapubic cystostomy is used for the removal of the stone, unless the prostatic obstruction is overcome a permanent suprapubic sinus will result, and therefore vesical calculus may be an indication for prostatectomy. (J. S. Joly.³¹)

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BLOOD-PRESSURE, RAISED. (See HYPERTENSION AND HYPERPIESIS.)

BLOOD-VESSELS, SURGERY OF. (See also ANEURYSM, ARTERIO-VEINOS; PULMONARY EMBOLISM; VARICOSE VEINS.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

W. W. Babcock¹ makes some interesting remarks on the modern surgical methods of treating diseases of the vascular system. For *aneurysms of the thoracic aorta*, division of the common carotid artery and internal jugular vein in the neck is recommended. The distal ends of the artery and vein are ligated, the cardiac ends are anastomosed. Thus a by-pass is provided, permitting the blood of the aneurysm to escape from the high-pressure arterial system into the low or negative pressure of the descending vena cava. The operation was performed nine times without operative mortality.

This writer condemns the operation of wiring and of ligature, either proximal or distal, in cases of aneurysm. In dealing with *arteriovenous communications*, he points out that if the artery is ligated proximal to the anastomosis, the condition is made worse. Ligation of the artery both proximal and distal to the fistula usually fails to relieve the condition owing to the very free anastomosis. After ligation of the artery and the vein, both above and below the fistula, recovery quickly follows.

The advantages of this quadruple ligature has been referred to many times by the reviewer [MEDICAL ANNUAL, 1916, p. 104; 1919, p. 188; and 1923, p. 42]. More ideal operations have been described, the object being to close by suture the communication between the artery and vein. Such theoretically desirable operations may be very difficult or practically impossible to perform.

Vein Ligation in the Treatment of Arteriosclerotic and Diabetic Gangrene.—H. E. Pearse² points out that there are two methods of conservative treatment of obliterative arterial diseases. The first is stimulation of the peripheral circulation by the judicious use of heat or contrast baths, the use of rest in bed, combined with appropriate exercise and massage, and non-specific protein therapy. The second method is the utilization of conservative surgical procedures which have the stimulation of the circulation as their object. Included in the latter class are peri-arterial sympathectomy, arterial excision, and vein ligation. Pearse points out that vein ligation in the treatment of obliterative vascular disease has not been widely adopted. There is no report of a series of cases in which the results are known a year or more after operation. He has collected a series of 28 cases in which the operation was done from one to four years ago and in which the late results were known.

It has been established that if occlusion of a large artery is accompanied by ligation of its companion vein it results in: (1) A lower incidence of gangrene; (2) An increase in functional capacity; (3) An increase in intravascular arterial and venous pressure; (4) An increase in the distal arterial circulatory bed; and (5) Probably an increase in the functional efficiency of the capillaries, though direct evidence for this is lacking. From theoretical considerations it would appear that the volume flow should be diminished, and this has recently been demonstrated by direct readings.

Because of its influence on the arterial circulation, therapeutic vein ligation has been suggested in: (1) Cases of sudden arterial obstruction, as by a ligature; (2) Cases of arteriovenous aneurysm; and (3) Cases of gradual arterial obliteration. It is obvious that the intravascular mechanics of these conditions differ, but they have in common arterial ischæmia and reduced arterial pressure. It probably is because of this that vein ligation has influence. Only cases of obliterative vascular disease will be considered here. In all, 31 cases in which this operation has been done are reported in the literature, but the end-results of many are not given. In the absence of definite data, it is impossible to draw conclusions from these case reports, but the impression is gained that approximately 50 per cent of the cases were benefited, while the remainder were unimproved. There are an additional 20 cases recorded in which vein ligation was done in conjunction with peri-arterial sympathectomy or arterial excision.

Selection of Suitable Cases.—A study of 20 unselected cases shows that 8 had satisfactory results, 8 were failures, and 4 terminated fatally within one year of operation without amputation. This gives a successful result in half the living cases, which corresponds to the impression gained from the literature. It follows that, since vein ligation appears to have benefit in some instances, the patients designated for the procedure should be carefully selected in order to eliminate those who are unsuitable. From the experience which has been gained in the past, it has been found convenient to group the patients with obliterative arterial disease into three classes. This classification is based on the study of the history, physical examination, laboratory procedures, and observations on the following points: (1) Location and extent of gangrene if it is present; (2) Colour of tissues in the elevated, horizontal, and dependent positions; (3) Presence or absence of œdema or infection; (4) Character of the pulsation in the arteries of the limb; (5) Rate of return of circulation after blanching by pressure; (6) Apparent temperature of the extremities; (7) The amount and character of pain; (8) Appearance of the skin and nails; (9) Presence or absence of muscle atrophy.

Under local anæsthesia the femoral vein is exposed in Scarpa's triangle, doubly ligated, and divided below the great saphenous vein. Alternatively, the popliteal vein is exposed in the lower part of the popliteal space, and is occluded below its junction with the lesser saphenous vein. Ligation of the femoral vein is preferable.

Results.—The beneficial effects of vein ligation are the subjective sensation of warmth, the diminution in pain, and the objective changes in the limb. These include accelerated healing of the local lesion, increase in the rate of return of the circulation after blanching, improvement in the colour of the extremity, and increase in temperature of the part. It has previously been recorded that a foot, formerly colder than the opposite side, is made persistently warmer by vein ligation.

The only possible detrimental effect of deep venous obstruction would be œdema. In approximately 30 operations of vein ligation, persistent œdema occurred in only 1 patient. In this instance the placing of the ligature on the popliteal vein above the lesser saphenous branch obstructed the deep and a part of the superficial venous return. This result is ascribed to a technical error rather than to a fundamental fault in the method.

Ligature of the Innominate Artery.—W. I. de C. Wheeler³ ligatured the innominate artery for aneurysm of the subclavian artery involving the first and second stage. The patient was wounded in 1915. A portion of a bullet could be felt to the right of the suprasternal notch under the insertion of the sternomastoid muscle (Fig. 11). The aneurysm did not become apparent

until thirteen years after the wound (1928). The pulsating swelling above the clavicle in 1932 was the size of a duck's egg. The right recurrent laryngeal nerve was paralysed. The radial pulse was not affected; the blood-pressure



Fig. 11. Subclavian aneurysm. The position of the tumour and line of incision is shown. X marks the position of the bullet.

was the same on both sides. X rays demonstrated some calcification within the sac (Plate V). The Wassermann reaction was negative.

Operation.—The middle portion of the clavicle was turned downwards on the chest with its pectoral attachments, in the hope that the subclavian artery could be ligated beneath the scalenus anticus muscle. It was found, however, that the sac extended to the bifurcation of the innominate artery and that ligation of the subclavian vessel was impossible. To give ample exposure and to avoid rough handling of the aneurysm (which had led to disaster in some of the recorded cases) the inner end of the clavicle, together with the right half of the manubrium sterni, was divided and retracted upwards and to the left. The innominate artery was now visualized in its entire length (Fig. 12). The innominate veins were not seen, the pleura caused no embarrassment, and the nerves remained hidden. Two ligatures of No. 2 chromicized catgut were passed round the artery distal to the thyroidea ima

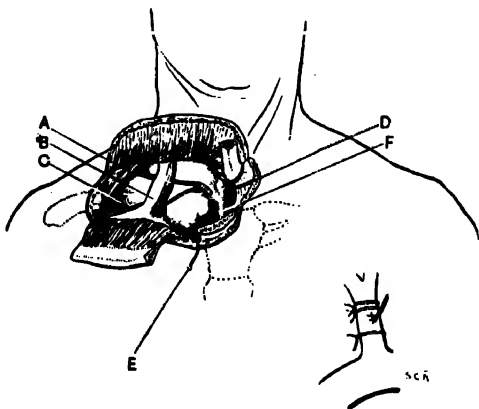


Fig. 12.—Subclavian aneurysm treated by ligature of the innominate artery. A, Transversalis colli artery; B, External jugular vein; C, Suprascapular artery; D, Sternoclavicular joint retracted upwards; E, Hook retractor just above attachment of first rib to sternum; F, Innominate artery. Inset shows ligatures applied proximal and distal to thyroidea ima branch.

branch. These were reinforced by a third ligature near the origin of the artery from the aorta.

Recovery was uneventful but for some downward displacement of the divided portion of the clavicle. After operation the radial pulse disappeared for three days and then became full and synchronous with the pulse on the opposite side. Four months after operation the cure of the aneurysm appeared complete. There was some slight pulsation at the site of the original tumour.

The ideal operation for subclavian aneurysm is excision of the sac after proximal and distal ligature. This operation has been successfully carried out by Halsted and also by L. R. Braithwaite.⁴ The possibility of ligaturing either the first or second portion of the artery is a condition precedent to excision.

The lesson learnt from the case just mentioned was that ligature of the innominate artery is not a difficult operation, provided the old inadequate methods of approach are abandoned. Ligature of the first stage of the subclavian is a much more serious undertaking, and on the left side is unjustifiable. A. K. Henry⁵ has shown, however, that ligature of the first part of the subclavian on the left side is simplified by an approach from behind.

Removal of Wire from Thoracic Aneurysm.—The reviewer introduced a wisp of Colt's wire into a thoracic aneurysm to the right of the sternum in 1928. A month later the end of the wisp at the point where the wires were joined became superficial and later ulcerated through the skin. The junction was nipped with pliers and all the strands of the wires were removed from the aneurysm without difficulty. Three months after operation the patient died from what was thought to be gradual leakage into the mediastinum and pleural cavity. No post-mortem was obtained.

REFERENCES ¹*Imcr Jour. Surg.* 1932, June, 401; ²*Jour. Amer. Med. Assoc.* 1932, March 12, 866, ³*Irish Jour. Med. Sci.* 1932, Oct., ⁴*Brit. Jour. Surg.* 1919-20, vii 390, ⁵*Ibid.* 1922 3, v, 367.

BONE TUMOURS ; DIAGNOSIS AND TREATMENT.

E. W. Hey Groves, M.S., F.R.C.S.

'Myeloma' and 'Sarcoma'.—The more the malignant tumours of bone are studied, the greater becomes the importance of differentiating various types of growth from one another. It is manifest that the old group of 'sarcoma' contains many utterly different kinds of growth—different in structure, course, prognosis, and treatment. Many years ago the giant-celled tumour was set in a class by itself as the myeloma— or, as modernists would have it, the osteoclastoma. But recently it has become evident that the myeloma is still closely related to the sarcoma. Thus C. C. Simmons¹ has analysed 116 cases from the American Register and has made most valuable observations about treatment and prognosis. Of the 116 cases the sexes were affected in equal proportions; in no less than 64 per cent was there definite history of preceding trauma. Although a large proportion of the cases properly treated made a good recovery lasting more than five years, yet in none were the cavities left by the scraping out of the growths filled up by new bone tissue. It was impossible to trace any difference in clinical behaviour corresponding to variations in histological structure. But the point of greatest importance is the fact that in no less than 6 out of 82 in which 'follow-up' was possible the patient died of metastatic growth. So that the notion that a myeloma was a tumour which had only local malignancy must be definitely abandoned. Summers points out that in every case where the evidence was available, the secondary growth—usually in the lung—did not show giant cells, and he infers that the original myeloma first becomes transformed into an osteogenic sarcoma and then gives rise to metastasis. However, this is a point of no practical importance.

PLATE V

SUBCLAVIAN ANEURYSM

(WHEELER)

Right subclavian aneurysm, showing position of bullet and some calcification in the sac.

Having recognized the potential general malignancy of the myeloma, it is necessary to inquire how far common methods of treatment were satisfactory in procuring a lasting survival. Of 26 cases treated by **Amputation**, 2 died of metastasis. The 13 cases treated by primary amputation showed no cases of recurrence of metastasis. It was in the 18 cases in which amputation was only resorted to after the failure of radiation or curetting that the late deaths occurred. There were 13 cases treated by **Resection** or **Excision**, with only 1 death from metastasis. There were 46 cases that healed primarily by **Curetting**, and of these only 17 were cured, the remainder having to have further treatment by resection or amputation. Resection or **Radiation** or the combination of the two methods gave good results in between 60 and 70 per cent. In only 8 cases was radiation alone used, and in these 6 were cured, 1 died of metastasis, and 1 had to have amputation.

[The summary of all these observations is that the treatment of myeloma should consist in amputation or wide excision—mere curetting being insufficient. Other workers are inclined to stress the value of radiation in the treatment of myeloma, but it is very important to avoid the error of being guided by a few selected cases into adopting this treatment for all.—E. W. H. G.]

L. Keatinge³ is very emphatic on the immediate response of certain types of bone tumour to **Radiation**, and she makes the practical suggestion that in all doubtful cases a course of six weeks' deep X-ray therapy is of great value as an aid both to diagnosis as well as treatment. Three of the cases described by this author are of especial interest. One was a man of 28 with a Ewing's sarcoma of the lower end of the femur. This growth disappeared under radiation, but metastasis occurred in the neck of the femur, the skull, and the vertebrae; but each of these was cured in its own turn by radiation. Then two cases of myeloma are shown as illustrating the effects of the X rays. And although for reasons given above we do not think that reliance should be placed on this method when excision is available, yet we must admit that the way in which the site of the myeloma appears to have been filled up by new bone is very impressive.

W. Magnusson³ discusses the radiation treatment of bone sarcoma. He has examined the records of 39 cases, in 16 of which radiation alone was used. He concludes that only in Ewing's sarcoma is radiation alone a justifiable treatment, but that there is distinct evidence of radiation being of great value after resection or amputation.

B. L. Coley, G. S. Sharp, and E. B. Ellis⁴ discuss the value of *aspiration of bone tumours as a method of diagnosis*. By using a wide-bored needle and a Record syringe it is usually possible to withdraw a quantity of cells as well as blood from the tumour. Sometimes a solid plug of tissue can be withdrawn which can be sectioned. The cells and blood are smeared on a slide and it is then easy to recognize typical tumour cells and to differentiate them from those which are inflammatory. They say that in only 1 of 35 cases was it impossible to make a diagnosis by this method, and in only 1 in 16 when subsequent operation was done was the diagnosis wrong.

[We have grave doubts whether the method of biopsy is an advance or a danger. Probably it should only be used in those cases where the weight of the clinical evidence points to the swelling being inflammatory. Then when exploratory puncture fails to withdraw pus, it is worth while to make a smear and search for tumour cells.—E. W. H. G.]

H. Hellner⁴ discusses the difficulties of diagnosis in many bone diseases and especially the *difficulty of distinguishing sarcoma from osteitis fibrosa*. Thus in one case the clinical evidence as well as the histological pointed to osteomyelitis and osteitis fibrosa, but subsequent events proved by lung metastasis

and death that the real disease was a sarcoma. In another case (osteitis fibrosa of the femur) the same mistake was made, and even amputation was too late to prevent death from lung metastasis. In one other case, on the contrary, clinical evidence and a biopsy were held to indicate sarcoma, but further examination after amputation proved the condition to be osteitis fibrosa.

Hellner also gives good figures of that most interesting and difficult condition known as *Ewing's sarcoma* (Plate VI), in the radius of a boy of 15. This is the latest entity to be picked out from the large and motley family of the sarcomata, and it is of the utmost practical importance to recognize it, for though it is generally first diagnosed as an osteomyelitis and will certainly kill the patient by secondary growths if unrecognized, it can be effectively treated by deep **X-Rays**, with a good prospect of permanent cure.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1931, Oct., 469; ²*Austral. and N.Z. Jour. of Surg.* 1932, March, 404; ³*Acta Radiol.* 1931, xii, 101; ⁴*Amer. Jour. Surg.* 1931, Aug., 215; ⁵*Arch. f. klin. Chir.* 1932, March, 423.

BOTHRIOCEPHALUS ANÆMIA. (See ANÆMIA, PERNICIOUS.)

BREAST, SURGERY OF. (See also CANCER, RADIUM TREATMENT OF).
Sir W. I. de C. Wheeler, F.R.C.S.I.

Chronic Cystic Mastitis.—J. S. Rodman¹ says that it does not yet seem settled what is the relationship, if any, between chronic cystic mastitis and carcinoma. It is agreed that the term 'precancerous' should no longer be used in describing the condition, but the term should be abandoned because it accentuates something which does not happen as a rule. Clinicians require some working rule to guide them in dealing with chronic cystic mastitis. The majority of 'lumps' in the mammary gland which are part of a chronic cystic mastitis are harmless, but some are not. In a general way, one will be fairly safe if each of these patients whose age falls into the active sexual cycle of the gland is first placed definitely into the menstrual phase which she shows. Then allow one menstrual period to intervene and see the case again about ten days after the period, or in the middle of the resting phase. If the lump is smaller and less tender, further conservatism is justified. All lumps which do not change, or which increase in size, particularly in women over 35, should then be removed. Rodman does not often do the radical amputation on those with chronic cystic mastitis, but still does it in certain cases in women over 40 where there are multiple small cystic masses in the gland, as it has been his experience so far that every now and again early malignancy is found in this type. Frozen sections are not of much value, as even the pathologists themselves admit, so that one must depend largely on one's own and the pathologist's opinion of the gross appearance.

O. C. Pickhardt² points out that there are two distinct schools of thought on this subject—that of Bloodgood, in America, and of Cheatle, in England. Bloodgood feels that chronic cystic mastitis is an essentially benign condition and remains so. Cheatle believes it to be a 'precancerous' condition and hence dangerous. With the aid of Dr. Rohdenburg, Director of the Lenox Hill Laboratory, Pickhardt has studied this problem from the theoretical and experimental angle and from the clinical analysis angle. The investigators received a very definite impression that the type of woman, whatever her age, suffering from this disease, was of the decidedly active kind. They are of the 'hyper' rather than of the 'hypo' type; and of the alert rather than the phlegmatic. From this it is but a step to the thought that their ovaries are overfunctioning. This condition has been shown by various authors, particularly E. Laquer, C. Ancel, and Leo Loeb, to have a definite effect on the

mammary gland. Ancel states, "Corpus luteum induces a proliferation of the mammary gland." Loeb states, "The mammary gland under the stimulus of persisting corpus luteum secretion grows to a considerable size and resembles in character that obtained in pregnancy." These conclusions were drawn from animal experimentation.

Cancer of the Breast and Borderline Tumours.—J. H. D. Webster³ describes X-ray and radium treatment of operable and borderline cases of cancer of the breast.

He comes to the following conclusions: (1) Further advances in the results of breast cancer treatment will come by combining operation with external radiation treatments, pre- and post-operative; or by employing them in selected cases as an alternative to operation. (2) Five-year results following external radiation have been shown to equal the results of, or excel, operation in similar cases. (3) The combination of radiation with operation may double the percentage of five-year surgical 'cures'. (4) Though medical and surgical opinion has been slow to advance in such directions, nevertheless the words which James Ewing used about eight years ago are true: "On account of the extremely variable anatomical and clinical characters of the disease, the difficulties of diagnosis, the danger of disseminating the disease by surgical manipulation, the extent of the radical operation, and the frequency of recurrences . . . radiation therapy . . . is destined to replace largely the surgery of mammary cancer."

J. C. Bloodgood⁴ calls attention to the fact that none of the non-encapsulated cystic adenomata which were classed as benign in an article published by him in 1921 has proved malignant after ten years' observation. In this article he discusses clinically benign conditions of the breast for which operation is not indicated. Borderline breast tumours in the clinical group are those in which, no matter what the signs or symptoms, malignancy cannot be ruled out with certainty. Borderline breast tumours prepared for microscopic examination and submitted to experienced pathologists for diagnosis yielded various opinions. Bloodgood is convinced that in borderline cases in which the surgeon is uncertain of his macroscopic diagnosis and the pathologist is uncertain of his frozen-section diagnosis, it is justifiable to remove the tumour alone and submit the sections to a number of pathologists of larger experience if possible. If the majority regard the neoplasm as malignant, the complete operation may follow; otherwise the breast can be saved.

Since 1925, benign lesions have outnumbered malignant lesions. Frozen-section diagnosis in the operating room is more necessary to prevent the immediate complete operation for cancer when the lesion is benign than to prevent the overlooking of a malignant lesion. The largest number of borderline tumours difficult to differentiate from cancer are found among the cystic adenomata, encapsulated and non-encapsulated; the intracystic papillomata in which the papilloma fills the cystic cavity; areas of chronic cystic mastitis in the walls of benign blue-domed cysts; and breasts with chronic cystic mastitis. Many photomicrographs of these conditions are included in the article.

Clinically benign tumours of long duration are very difficult to diagnose. The most helpful clinical evidence against malignancy is youth of the patient (under 25 years).

Cancer and chronic cystic mastitis are very rarely associated. The danger of cancer in a papillomatous cyst has been exaggerated. Bloodgood has no evidence that the breast with chronic cystic mastitis (Schimmelbusch) is more likely to develop cancer than other breasts. He believes that there is no justification for the removal of a breast which is not involved by cancer in order to protect the patient from a possible future cancer.

Cancer of the Breast in the Male.—R. Rosh⁵ deals with this subject. Cases of Paget's disease of the male nipple have been described by several authors, and cases of carcinoma of the breast have been recorded in a boy of 12, and also in a boy aged 14 years and 8 months.

Breast Abscess.—J. E. Hobbs⁶ writes on this subject: Adequate drainage through a very small incision can be established as follows: Under nitrous oxide anæsthesia, a stab wound is made large enough to accommodate a rubber tube $\frac{1}{2}$ in. in diameter. The incision should be made at the lower or outer margin of the abscess and carried radially from the nipple, staying outside the

areola in order not to cut any of the lactiferous ducts. The finger is inserted into the cavity and all septa between the pus pockets are broken down. The rubber tube is now inserted into the cavity and fixed to the skin with a silk or catgut suture. A Dakin's tube is then inserted through the rubber tubing (*Fig. 13*), or, if the cavity is large enough, two Dakin's tubes may be inserted. The cavity may be thoroughly washed out with hypochlorite of sodium, a painless procedure. There can be no distension of the cavity with fluid, for the large tube acts as a reflux.

The question of supportive binders is one of importance. The requisites of a good binder are, first, that it must lift the breast; secondly, that it must compress the breast against the chest wall; thirdly, that it must not be too bulky, and must maintain its original application from one dressing until the next. Most breast binders become loose and do not elevate the breast. Adhesive strapping gives good support and compression if long and wide strips are used, but adhesive tape is painful to remove, and many skins are sensitive to it, and a marked local reaction is produced. A satisfactory binder can be made of gauze 16 in. wide and 5 yards long, folded so that it is 4 in. wide. This can be rolled, wrapped in a cloth, autoclaved, and kept sterile. With the gauze roll, the mammary gland can be lifted upward by carrying the bandage up over the opposite shoulder (*Fig. 14*),

and firm pressure can be secured by carrying the bandage around the chest wall (*Fig. 15*). These binders do not slip, and in addition they serve as a protective dressing. When support is no longer needed and the drainage is scanty, a small dressing applied with narrow strips of adhesive tape is substituted.

Hobbs summarizes as follows:—

1. The occurrence of breast abscesses can be prevented in great part by suitable prophylactic measures, but owing to neglect by the attending physician or mother, they still occur frequently during the lactation period.
2. It is important to establish proper drainage with minimum scarring of the breast. This can be done as described above.

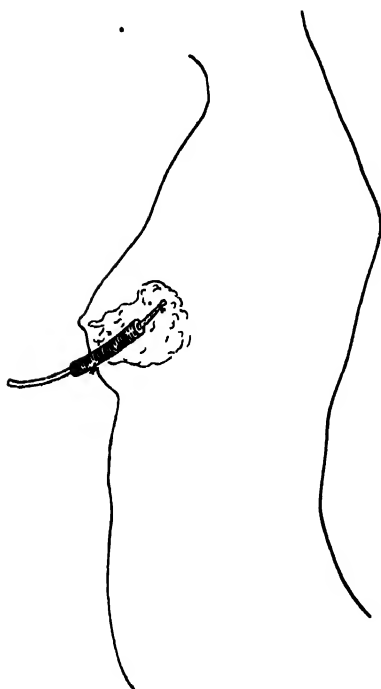


Fig. 13 Drawing showing a half-inch rubber drain inserted into the abscess cavity and anchored to the skin with a silk or catgut suture. A Dakin's tube is inserted through the rubber drain into the abscess cavity. (*Figs. 13-16 by kind permission of 'Surgery, Gynecology and Obstetrics.'*)

3 Vaseline gauze is a dressing which can be removed and applied without pain to the patient. It protects the skin from the irritating and macerating effect of the discharge. It is imperative that this or some other oily dressing be used when the cavity is irrigated with hypochlorite of sodium



Fig 14 Showing the first procedure in applying the gauze roll bandage. Note the elevation of the breast in comparison to the opposite one

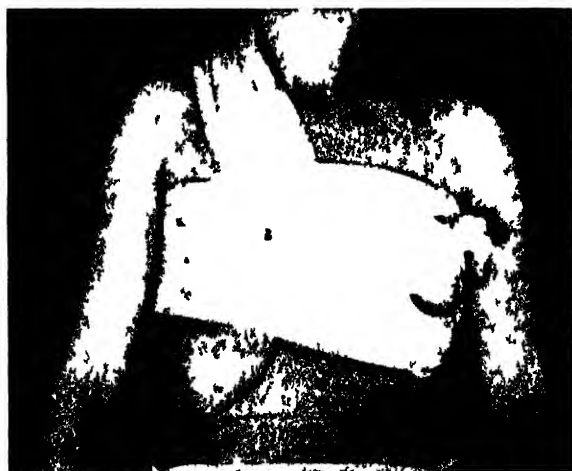


Fig 15—showing the bandage completely applied. By carrying the bandage around the chest wall as much pressure can be applied as desired. Note the Dakin's tube brought out through the dressing, the end being kept sterile by placing a small piece of gauze over it

4 A gauze roll makes an excellent binder, for it gives support and compression, and serves as a protective dressing

REFERENCES—¹*Ann of Surg* 1932, July, 149, ²*Ibid* 151, ³*Brit Med Jour* 1932, ii, 47, ⁴*Amer Jour Cancer*, 1932, xvi, 103 (abstr in *Surg Gynecol and Obst* 1932, May, 433), ⁵*Amer Jour Surg* 1931, Sept 514, ⁶*Surg Gynecol and Obst* 1932, May, 839

BRIGHT'S DISEASE. (See RENAL DISEASE)

BRILL'S DISEASE. (*See* TYPHUS FEVER, TROPICAL.)**BRITISH PHARMACOPŒIA, 1932.** *Ivor J. Davies, M.D., F.R.C.P.*

The publication of a new *British Pharmacopœia* is a notable event. The present is the sixth *British Pharmacopœia*, and has been prepared by the Pharmacopœia Commission and published under the direction of the General Council of Medical Education and Registration of the United Kingdom. It will be seen that there are many valuable additions which are thoroughly representative of modern therapy. Many old preparations have been omitted, some of which were popular and will be included in the new edition of the *British Pharmaceutical Codex*. In its introduction to the new B.P. the Commission states that the Committee of Civil Research, Sub-Committee on the British Pharmacopœia, has recommended that in future the B.P. should be revised every ten years. It may be found expedient to issue from time to time a supplement.

In selecting the drugs to be included in the B.P. the Commission has been guided by a desire to include only those substances which are of sufficient medicinal value to justify the continuance of their use by prescribers. The last B.P. contained several instances of groups of drugs which have the same or similar active principles or are employed for the same therapeutic purposes; as, for example, the astringents. In preparing this B.P. the number of such drugs has been reduced by selecting from each group those which appeared to be the most valuable. The group of hypodermic injections of the B.P. 1914 has been omitted. It is considered preferable that the medical practitioner should prescribe the dose of the active material as such, rather than the dose of an official hypodermic injection.

Many of the formulæ for powders and pills have been omitted on the ground that the prescribing of combination of drugs in these forms should be left to the individual practitioner. It has been thought advisable, however, to retain the formulæ for a few widely used combinations of drugs. In conformity with the article of the International Agreement which requires that "no potent drug shall be prepared in the form of a medicinal wine", the wines of the B.P., 1914, have been omitted. Vinum ipecacuanhæ has thus been dropped and reappears under the name of 'tinctura ipecacuanhæ'.

Many old popular preparations are not included in this issue, such as dilute nitrohydrochloric acid, ammonium bromide, butyl-chloral hydrate, effervescent caffeine citrate, glycerin of pepsin, liquor bismuthi et ammonii citratis, syrup of chloral, and many others. The two tinctures of iodine of the old B.P. have been renamed 'strong solution of iodine' and 'weak solution of iodine' respectively, and a third solution of iodine appears under the name of 'liquor iodi simplex', which corresponds closely with the old French Codex preparation. There are many additions, such as amidopyrin; soluble barbitol (*medinal**); phenobarbitone (*luminal*); soluble phenobarbitone (*sodium luminal*); quinine sulphate; saccharin; sodium citrate; *strophanthin*; cataplasma kaolini; dextrose; powdered digitalis; *emetine hydrochloride*; emetine and bismuth iodide; *ephedrine hydrochloride*; liver extract in two forms, liquid and dry; extract of malt and extract of malt and cod-liver oil; *pituitary extract*; gelatinum zinci (Unna's paste); *the official recognition of sera, toxins, and dyes*; intramuscular injections of bismuth, mercury, iron, insulin; *irradiated ergosterol*; physiological salt solution; *neosarsphenamine* (neosalvarsan); sulpharsphenamine (sulpharsenobenzene); syrupus ferri phosphatis co.; oxygen; nitrous oxide; and orthoform.

* The italics are mine, to emphasize the introduction of important preparations.—I. J. D.

The infusions of the old B.P. which have been retained are now renamed 'fresh infusions'. Concentrated infusions have also been introduced, which, on dilution, resemble the fresh infusions, although in some cases a freshly made infusion may be preferred. Thus it must be emphasized that if a fresh infusion is desired, the prescriber must order 'Inf.-Rec.', or otherwise the new official concentrated infusion may be used. This is an excellent innovation. Certain changes in nomenclature must be noted, especially as in some cases there are also changes in composition, e.g. :—

• B.P. 1914

Æther Purificatus
Emplastrum Resinæ
Liquor Trinitrini
Pulvis Ipecacuanhæ Co.
Tinctura Camphoræ Co.

B.P. 1932

Æther Anæstheticus
Emplastrum Colophonii
Liquor Glycerylis Trinitratis
Pulvis Ipecacuanhæ et Opii
Tinctura Opii Camphorata

The exclusive use of the metric system of weights and measures for formulae is retained, and doses are still given in metric and English systems.

A Posological Table of the drugs and preparations in the 1932 *British Pharmacopœia* follows :—

POSOLOGICAL TABLE.

Acetum Scillæ	m. 10-30	Antitoxinum Welchicum (by injection)	m. 5-15	Camphora	gr. 2-5
Acidum Aceticum Dil.	m. 30-60	Prophylactic, units 4000	m. 5-15	(subcutaneously)	gr. 1-3
Acetylsalicylicum	gr. 5-15	Therapeutic (intravenously), units 10,000-20,000	m. 5-15	Capsicum	gr. 1-2
Benzoinum	gr. 5-15	Apomorphine Hydrochloridum (expectant dose)	m. 5-15	Carbonei Tetrachloridum	m. 30-60
Boricum	gr. 5-15	(hypnotic or emetic dose — subcutaneously) gr. 1/64-1/32	m. 5-15	Carbomalam	gr. 5-15
Citricum	gr. 5-30	Aqua Anethi Conc.	m. 5-15	Cardamomum	gr. 10-30
Hydrobromicum Dil.	m. 15-60	— — Dest.	fl. oz. 1-1	Carum	gr. 10-30
Hydrochloricum Dil.	m. 5-60	— Camphoræ	fl. oz. 1-1	Caryophyllum	gr. 2-5
Hydrocyanicum Dil.	m. 2-5	— Chloroformi	fl. oz. 1-1	Cascara Sagrada	gr. 20-60
Hypophosphorosum Dil.	m. 5-15	— Cinnamomi Conc.	m. 5-15	Cassia	gr. 60-120
Lacticum	m. 5-20	— — Dest.	fl. oz. 1-1	Catechu	gr. 5-15
Oleicum	m. 5-15	— Mentha Piperitis Conc.	m. 5-15	Chloralis Hydras	gr. 5-20
Phosphoricum Dil.	m. 5-60	— — Dest.	fl. oz. 1-1	Chlorbutol	gr. 5-20
Salicylicum	gr. 5-10	Argenti Nitrus	gr. 1-1	Chloroformum	m. 1-5
Sulphuricum Dil.	m. 5-60	Arseni Triiodidum	gr. 1/16-1/4	Cinchona	gr. 5-15
Tannicum	gr. 5-10	— Trioxidum	gr. 1/60-1/12	Cinchophenium	gr. 5-15
Tartaricum	gr. 5-30	Asafetida	gr. 5-15	Cinnamomum	gr. 5-20
Adrenalina (by injection)	gr. 1/600-1/120	Atropina	gr. 1/240-1/60	Cocaina	gr. 1-1
Æther	m. 15-60	Atropina Sulphas	gr. 1/240-1/60	Cocaina Hydrochloridum	gr. 1-1
Agar	gr. 60-240	Balsamum Peruvianum	m. 5-15	Codeina	gr. 1-1
Aloe	gr. 2-5	— Tolutanum	gr. 5-15	Codeina Phosphas	gr. 1-1
Alouinum	gr. 1-1	Barbitonum	gr. 5-10	Colehici Cornus	gr. 2-5
Alumen	gr. 5-10	— Solubile	gr. 5-10	— Semen	gr. 2-5
Amidopyrina	gr. 5-10	Belladonna Pulverata	gr. 1-3	Colocynthis	gr. 2-5
Ammonii Bicarbonas	gr. 5-10	Belladonna Radix	gr. 1-2	Confectio Sennæ	gr. 60-120
— Carbonas	gr. 5-10	Benzocaina	gr. 5-10	— Sulphuris	gr. 60-120
— Chloridum	gr. 5-60	Benzoinum	gr. 10-30	Copaiba	m. 10-30
Amylils Nitris (by inhalation)	m. 2-5	Betanaphthol	gr. 5-10	Coriandrum	gr. 5-15
Amylocainæ Hydrochloridum (orally or subcutaneously)	gr. 1-1	Bismuthi Carbonas	gr. 10-30	Croosotum	m. 2-10
(intrathecally)	gr. 1-1	— Salicylas	gr. 10-30	Cresol	m. 1-3
Antimonii et Potassii Tartaras (emetio dose)	gr. 1/32-1/8	(intramuscularly)	gr. 1-2	Creta	gr. 15-60
(intravenously)	gr. 1-1	Bismuthum Precipitatum (intramuscularly)	gr. 1-3	Cupri Sulphas (emetio dose)	gr. 1-2
— Sodii Tartaras	gr. 1/32-1/8	Borax	gr. 5-15	Diamorphina Hydrochloridum	gr. 1/24-1/8
(emetio dose)	gr. 1-1	Buachu	gr. 15-30	Digitalis Pulverata (single dose)	gr. 1-1
(intravenously)	gr. 1-1	Caffeina	gr. 2-5	Elixir Cascara Sagrada	m. 30-60
Antitoxinum Diphthericum (by injection)	gr. 1-2	— et Sodii Benzoas (by injection)	gr. 2-5	Emetina et Bismuthi Iodidum	gr. 1-3
Prophylactic, units 500-1000		Calcii Carbonas	gr. 15-60	— Hydrochloridum (by injection)	gr. 1-1
Therapeutic, units 10,000-20,000		— Chloridum (intramuscularly)	gr. 10-30	Ephedrina Hydrochloridum	gr. 1-1
— Tetanicum (by injection)		(intravenously)	gr. 1-1	Ergota Preparata	gr. 5-15
Prophylactic, units 1000-2000		— Hydroxidum	gr. 5-15	Ergotoxinæ Athanosulphonas (subcutaneously or intramuscularly)	gr. 1/120-1/60
Therapeutic, units 20,000-40,000		— Lactas	gr. 15-60	Erythrityls Tetranitras Dil.	gr. 1-2 (representing gr. 1-1 of pure Erythrityl Tetranit.)
		— Phosphas	gr. 10-30		
		Calumba	gr. 10-30		

Eucalyptol m. 1-3
 Extractum Belladonnæ Liq. m. 1-1
 — Siccum gr. 1-1
 — Cascara Sagradae Liq. m. 30-60
 — Siccum gr. 2-8
 — Cinchona m. 5-15
 — Liq. m. 2-6
 — Cololchli Liq. gr. 1-1
 — Siccum gr. 1-1
 — Colocynthis Co. gr. 2-8
 — Ergotæ Liq. m. 10-20
 — Felle Bovini gr. 5-15
 — Filicis m. 45-90
 — Gentianæ gr. 2-8
 — Glycyrrhizæ gr. 10-30
 — Liq. m. 30-60
 — Hamamelidis Liq. m. 30-60
 — Hepatis Liq. fl. oz. 1
 — Siccum. quantity equiv. to ½ lb. of fresh liver
 — Hyoscyami Liq. m. 3-6
 — Siccum gr. 1-1
 — Ipecacuanhæ Liq. (emetic dose) m. 1-2
 — Krameris Siccum m. 10-30
 — Malti m. 60-240
 — c. Oleo Morrhuæ m. 60-240
 — Nucis Vomice Liq. m. 1-3
 — Siccum gr. 1-1
 — Opi Siccum gr. 1-1
 — Pituitari Liq. (subcutaneously) units 2-5
 Extractum Senegæ Liq. m. 5-15
 — Senugæ Liq. m. 10-30
 Ferri Carbonas Saccharatus gr. 10-30
 — et Ammonii Citras gr. 5-15
 — Quinina Citras gr. 5-15
 — Sulphas gr. 1-5
 — Exsiccatas gr. 1-3
 Ferrum Redactum gr. 1-10
 Filix Mas gr. 60-180
 Foniculum gr. 5-10
 Gentiana gr. 10-30
 Glycerinum m. 60-120
 (rectally) m. 30-120
 — Acid Boricæ m. 10-30
 — Tannici m. 10-30
 — Aluminis m. 30-60
 — Boracis m. 30-60
 — Phenolis m. 5-15
 Glycyrrhiza gr. 15-60
 Guaiacol m. 5-10
 Hexamina gr. 10-30
 Homatropina Hydrobromidum gr. 1/64-1/32
 Hydrargyri Iodidum Rubrum gr. 1/32-1/16
 — Oxycyanidum (intramuscularly) gr. 1/12-1/6
 — (intravenously) gr. 1/32-1/16
 — Perchloridum gr. 1/32-1/16
 — Subchloridum gr. 1-3
 — (intramuscularly) gr. 1-1
 Hydrargyrum gr. 1-3
 — (intramuscularly) gr. 1-1
 — c. Oreta gr. 1-5
 Hyoscina Hydrobromidum gr. 1/200-1/100
 Hyoscyamus gr. 3-6
 Iodthammiol gr. 5-10
 Iodoformum (subcutaneously or intramuscularly) gr. 1-1
 — (intravenously) gr. 1-1
 Infusum Aurantii Conc. m. 30-60
 — Recens fl. oz. 1-1
 — Buchu Conc. m. 60-120
 — Recens fl. oz. 1-2

Infusum Calumbæ Conc. m. 30-60
 — Recens fl. oz. 1-1
 — Caryophylli Conc. m. 30-60
 — Recens fl. oz. 1-1
 — Digitalis Recens m. 90-300
 (single dose) fl. oz. 1-4
 — Gentianæ Co. Conc. m. 30-60
 — Recens fl. oz. 1-1
 — Quassia Conc. m. 30-60
 — Recens fl. oz. 1-1
 — Senegæ Conc. m. 30-60
 — Recens fl. oz. 1-1
 — Scennæ Conc. m. 30-120
 — Recens fl. oz. 1-2
 Injectio Bismuthi (intramuscularly) m. 8-15
 — Salicylatis (intramuscularly) m. 10-20
 — Ferri (intramuscularly) m. 15-30
 — Hydrargyri (intramuscularly) m. 5-10
 — Subchloridi (intramuscularly) m. 10-20
 Insulinum (subcutaneously) units 5-100
 Iodoformum gr. 1-3
 Iodophthalinum gr. 1-1 per lb. of body weight, up to gr. 75 (intravenously) up to gr. 45
 Ipecacuanhæ Pulverata gr. 1-2
 (emetic dose) gr. 15-30
 Ipomœa gr. 5-20
 Jalapa Pulverata gr. 5-20
 Kaolinum oz. 1-2
 Krameria gr. 10-30
 Liquor Adrenalinae Hydrochloridi (subcutaneously) m. 2-8
 — Ammonie Dil. m. 10-20
 — Ammonii Acetatis Dil. fl. oz. 1-1
 — Fort. m. 15-60
 — Arseni et Hydrargyri Iodidi m. 5-15
 — Aneurinæ m. 2-8
 — Calcii Hydroxidi fl. oz. 1-4
 — Ergosterolis Irradiati Prophylactic doses (daily) for an infant, units 1000-3000 (m. 5-15)
 Curative doses (daily) for an infant, units 5000-10,000 (m. 25-50)
 — Ferri Perchloridi m. 5-15
 — Glycerolis Trinitratis m. 1-2
 — Hydrargyri Perchloridi m. 30-60
 — Hydrogeni Peroxidi m. 30-120
 — Iodi Mitis m. 5-30
 — Simplex m. 3-15
 — Magnesii Bicarbonatis fl. oz. 1-2
 — Morphinae Hydrochloridi m. 5-30
 — Quininae Ammonias m. 30-60
 — Strychninae Hydrochloridi m. 3-12
 Lobelia gr. 1-3
 Magnesii Carbonas Levis gr. 10-60
 — Ponderosus gr. 10-60
 — Oxidum Leve grm. 10-60
 — Ponderosum grm. 10-60
 — Sulphas gr. 30-240
 Menthol gr. 1-2
 Methylis Salicylas m. 5-15
 Methylsulphorhal gr. 5-30
 Methylthionina Chloridum gr. 1-5
 Mistura Magnesii Hydroxidi m. 60-240
 — Senne Co. fl. oz. 1-2

Morphinae Hydrochloridum gr. 1-1
 — Tartaras gr. 1-1
 Muellago Acaciae m. 60-240
 — Tragacanthæ m. 60-240
 Myristica gr. 5-10
 Myrrha gr. 5-15
 Neocarphenamina (intravenously) gr. 24-14
 Nux Vomica Pulverata gr. 1-4
 Oleum Amygdalæ fl. oz. 1-2
 — Anethi m. 1-3
 — Anisi m. 1-3
 — Arachidis fl. oz. 1-1
 — Cajuputi m. 1-3
 — Cari m. 1-3
 — Caryophylli m. 1-3
 — Chenopodii m. 3-15
 — Cinnamomi m. 1-3
 — Coriandri m. 1-3
 — Cucalypti m. 1-3
 — Gossypii Semina fl. oz. 1-1
 Oleum Hydnocarpii m. 5-15
 — increasing gradually to m. 80 (subcutaneously or intramuscularly) m. 30, increasing gradually to m. 75
 — Aethylicum m. 5-15
 — increasing gradually to m. 60 (subcutaneously or intramuscularly) m. 30, increasing gradually to m. 75
 — Lavandulae m. 1-3
 — Limonis m. 1-3
 — Lini fl. oz. 1-1
 — Menthae Piperitæ m. 1-3
 — Morrhuæ m. 30-120
 — Myristicæ m. 1-3
 — Olivæ fl. oz. 1-1
 — Ricini m. 60-240
 — Rosmarini m. 1-3
 — Santali m. 5-15
 — Australiensis m. 5-15
 — Sesami fl. oz. 1-1
 — Terebinthinae (authelminthic dose) m. 120-240
 Opium Pulveratum gr. 1-3
 Orthocaula gr. 1-3
 Oxymel m. 30-120
 — Scilla m. 30-60
 Pancreatinum gr. 5-10
 Paraffinum Liq. fl. oz. 1-1
 Paraldehydum m. 30-120
 Pelletierinae Tannas gr. 2-8
 Pepsinum gr. 5-10
 Phenacetinum gr. 5-10
 Phenazonum gr. 5-10
 Phenobarbitonum gr. 1-2
 — Solubile gr. 1-2
 Phenol gr. 1-3
 — Liquefactum m. 1-3
 Phenolphthaleinum gr. 1-5
 Physostigminæ Salicylas gr. 1/100-1/50
 Pilocarpina Nitras gr. 1/20-1/5
 Pilula Aloes gr. 4-8
 — et Asafetida gr. 4-8
 — et Ferri gr. 4-8
 — Colocynthis et Hyoscyami gr. 4-8
 — Ferri Carbonatis gr. 5-30
 — Hydrargyri gr. 4-8
 — Rhei Co. gr. 4-8
 Pix Liquida gr. 2-10
 Plumbi Acetas gr. 1-3
 Podophylli Resina gr. 1-1
 Podophyllum gr. 2-10
 — Indicum gr. 2-10
 Potassii Acetas gr. 15-60
 — Bicarbonas gr. 15-60
 — Bromidum gr. 5-30
 — Carbonas gr. 2-6

Potassii Chloras	gr. 5-10	Sodii Salicylas	gr. 10-30	Tinctura Catechu	m. 30-60
— Citras	gr. 15-60	— Sulphas	gr. 30-240	— Cinchonæ	m. 30-60
— Iodidum	gr. 5-30	— Effervescentes	gr. 60-240	— Co.	m. 30-60
— Nitrates	gr. 5-15	Spiritus Ætheris	m. 15-60	— Cocci	m. 5-15
— Permanganas	gr. 1-3	— Nitrosi	m. 15-60	— Colchici	m. 5-15
— Tartaras Acidus	gr. 15-60	— Ammonias Aromaticus	m. 15-60	— Digitalis	m. 5-15
Procalinas Hydrochloridum	gr. 1-2	— (ajaputi)	m. 5-30	— (single dose)	m. 30-60
(subcutaneously) up to gr. 15		— Camphoræ	m. 5-30	— Gentianæ Co.	m. 30-60
(intrathecally) up to gr. 2½		— Chloroformi	m. 5-30	— Hyoscyami	m. 30-60
Prunus Serotina	gr. 15-30	— Menthas Piperitæ	m. 5-30	— Ipecacuanhæ	m. 10-30
Pulvis Cretæ Aromaticus	gr. 10-60	Stramonium	gr. 1-3	— (emetic dose)	fl. oz. 1-1
— — — cum Opio	gr. 10-60	Strophanthinum (intramus-		— Krameris	m. 30-60
— Glycyrrhizæ Co.	gr. 60-120	cularly or intravenously)		— Jambonis	m. 30-60
— Ipecacuanhæ et Opli	gr. 5-10	gr. 1/240-1/60		— Lobelia Æthere	m. 5-15
— Jalapæ Co.	gr. 10-60	Strychnina Hydrochloridum	gr. 1/32-1/8	— Myrrhæ	m. 30-60
— Pulvis Rhei Co.	gr. 10-60	Styrax	gr. 10-30	— Nucis Vomice	m. 10-30
— Tragacanthæ Co.	gr. 10-60	Sulpharphenamina (subcuta-		— Opi	m. 5-30
Quassia	gr. 2-8	eously or intramuscularly)		— Camphorata	m. 30-60
Quillaja	gr. 1-3	gr. 1½-10		— Quassia	m. 30-60
Quinidina Sulphas	gr. 3-10	Sulphonal	gr. 5-30	— Quillaja	m. 30-60
Quinina Sulphas	gr. 1-10	Sulphur Precipitatum	gr. 15-60	— Rhei Co.	m. 30-60
— Dihydrochloridum	gr. 1-10	— Sublimatum	gr. 15-60	— Scilla	m. 5-30
(intravenously or intramus-		Syrupus Auranti	m. 30-120	— Senna	m. 30-60
cularly)	gr. 5-10	— Ferri Iodidi	m. 30-120	— Stramonii	m. 5-30
— et Athylis Carbonas	gr. 1½-15	— Phosphatis Co.	m. 30-120	— Strophanthi	m. 2-5
— Hydrochloridum	gr. 1-10	— — — cum Quinina et		— Tolutani	m. 30-60
— Sulphas	gr. 1-10	Strychnina	m. 30-60	— Valeriana Ammoniata	m. 30-60
— Tannas	gr. 1½-15	— Lanonis	m. 30-120	— Zingiberis Iodis	m. 5-10
Resorcinol	gr. 1-5	— Pruni Serotina	m. 30-120	— Mitis	m. 30-60
Rheum	gr. 3-15	— Scilla	m. 30-60	— Totacina	gr. 1-10
Saccharinum Solubile	gr. 1-2	— Senna	m. 30-120	Totum Diphthericum Cale-	
Salicinum	gr. 5-15	— Tolutanus	m. 30-120	factum (intradermally) m. 3	
Santonium	gr. 1-3	— Zingiberis	m. 30-120	— Detoxicatam (subcuta-	
Seammonia Resina	gr. 1-3	Tabella Glycerylis Trinitati		eously) indicated on label	
Scilla	gr. 1-3	1-2 tabls		— — Diagnosticum (intra-	
Senega	gr. 6-12	(1 tablet — gr 1/130 approx)		dermally) m. 3	
Scarus Fohum	gr. 10-30	Terebinthum	m. 5-15	Trinitrophenol	gr. 1-5
— Fructus	gr. 10-30	Theobromina et Sodii Salicylas	gr. 10-20	(tuberculum Pristinum (sub-	
Serpentaria	gr. 1-1½	Theophyllina et Sodii Actas	gr. 2-5	cutaneous))	
Serum Antidyentericum (Shiga)		Thymol	gr. 1-2	Diagnostic m. 1/60-1/12	
(by injection) units 4000-10,000		— (anthelmintic dose) gr. 15-30		Therapeutic m. 1/60,000	
Sodii Benzoas	gr. 5-30	Thyroideum	gr. 1-5	gradually increased	
— Bicarbonas	gr. 15-60	Thyroxinsodium	gr. 1/60-1/64	Urea	gr. 15-240
— Bromidum	gr. 5-30	Tinctura Asafetida	m. 30-60	Vaccinum Typhlo-paratyphosum	
— Carbonas	gr. 5-15	— Auranti	m. 30-60	(subcutaneously), first, mul. 0·3,	
— — Exsiccatus	gr. 2-5	— Belladonna	m. 5-30	second, after 7 to 10 days'	
— Citras	gr. 15-60	— Benzoini Co	m. 30-60	interval,	
— et Potassii Tartaras	gr. 120-240	— Calumbæ	m. 30-60	— Vaccinae (by scarification) m. 1	
— Iodidum	gr. 5-30	— Capsici	m. 5-15	Valeriana	gr. 5-15
— Nitrils	gr. 1-2	— Cardamomi Co	m. 30-60	Zinci Oxidum	gr. 5-10
— Phosphas	gr. 30-240			— Sulphas	gr. 1-3
— — Acidus	gr. 30-60			(emetic dose)	gr. 10-30
— — Effervescentes	gr. 60-240			Zingiber	gr. 5-15

BRONCHIECTASIS.

W. H. Wynn, M.D., F.R.C.P.

W. G. Oakley¹ discusses the indications for **Phrenic Avulsion** in bronchiectasis. The operation generally employed is avulsion of the phrenic nerve through a small incision above the clavicle, breaking its connection with the suprpleural plexus and all accessory fibres. Although usually successful, it may fail to produce a permanent paralysis even after as much as seven inches of nerve have been avulsed. The complications of the operation, more formidable in theory than practice, fall into three main groups: (a) Those due to failure in technique; (b) Those due to adhesions in the course of the nerve; and (c) Reflex disturbances. In the first group hæmorrhage is the most frequent and serious, and results from injury either to the pericardio-phrenic artery or to the subclavian vein. The former is readily controlled and never fatal; the latter is more serious and has been responsible for the very few deaths that have been reported. The vein may be torn as the result of tension on the sling formed by the phrenic and accessory phrenic nerves, which pass respectively behind and in front of the vein; the accessory nerve, however, almost always breaks first. In the second group the nature of the complication

depends upon the structure to which the nerve is adherent and varies from slight hæmoptysis to cold abscess formation, pneumo- and pyopneumothorax, and even to fatal mediastinitis when caseous foci are opened up. The presence of a tuberculous empyema and of pleural adhesions over the nerve have been considered contra-indications to avulsion. Reflex disturbances are cardiac and respiratory and probably owe their origin to interference with the vagus and intercostal nerves. They are usually slight and transient, consisting of tachycardia, alterations in pulse volume, and dyspnoea.

The sequels are insignificant, consisting mainly of pain in the corresponding shoulder and more rarely of tachycardia, dyspnoea, and digestive upsets.

In man one-third of the total air inspired is due to the action of the diaphragm in keeping the lower lobes fully expanded, and the basal collapse which results from its paralysis is brought about by the unopposed action of the abdominal muscles. The paralysis induced by the operation is strictly unilateral, and is shown by an immediate and progressive rise of the dome, which in the course of three to six months undergoes complete atrophy and is converted into a thin parchment-like structure. The effect on the thorax is to decrease the capacity of the corresponding lung by one-fourth to one-third—or on the right side by 400 to 800 c.c. The effects produced upon the lung consist of partial compression and relaxation, with the addition of rest, consequent upon the removal of the forces exerted upon it by the contractions of the diaphragm. There is some disagreement about the extent of the lung tissue affected and consequently about the type of case for which the operation is most indicated. Some observers limit the effect to the lower lobe, while others claim that the effect on the apex is as great as on the middle and lower lobe. The capacity for spontaneous retraction and collapse of a lesion is probably more important than the position of the lesion. In bronchiectasis this spontaneous retraction is so often responsible for the production and progression of the lesion that the result of phrenic avulsion must depend upon its success in actively collapsing and compressing the dilated bronchi. Active compression in diaphragmatic paralysis is greatest at the base and in the presence of dilated bronchi, and fibrosis in this position will become increasingly less as the apex is approached. The position and extent of the lesion, therefore, together with the degree of rise of diaphragm obtained are likely to be the most important factors in the treatment of bronchiectasis by phrenic avulsion.

In 3 years 17 cases were observed. The operation was carried out 9 times on the left side and 8 on the right, paralysis of the corresponding dome being observed by X rays in each case. Pain in the shoulder occurred in about half the cases. Section of the thoracic duct occurred once and was followed by a chylous discharge of short duration. No serious hæmorrhage occurred. In 4 cases artificial pneumothorax had been previously tried, but in 3 was prevented by adhesions. In one it was successful in relieving the cough, but as soon as the air was absorbed the cough returned. In 4 cases the symptoms were completely relieved. In 7 there was lasting improvement, 6 reaching a stationary condition and 1 continuing to improve; in 2 of these sputum disappeared entirely, and in 4 it decreased. In 6 cases there was a temporary improvement followed by relapse, but in 2 of these a new growth was found later. The author concludes that only in strictly basal and unilateral cases can phrenic avulsion be reasonably expected to relieve the symptoms. In unilateral cases in which the upper and middle zones are affected temporary improvement is the rule, but relapse must be expected unless thoracoplasty is performed. As a preliminary to the thoracoplasty phrenic avulsion should always be done, but should not be allowed to shelve the larger operation in the event of a brilliant but temporary cure.

REFERENCE.—¹*Brit. Med. Jour.* 1937, ii, 378.

BRONCHIECTASIS : SURGICAL TREATMENT.*A. Tudor Edwards, M.Ch., F.R.C.S.*

Bronchiectasis, a disease for which medical treatment has never been able to do more than delay the inevitable downward course, is now being studied from a surgical standpoint. Treatment by **Bronchoscope Aspiration** is somewhat in the same category as postural drainage in that it improves patients temporarily and thereby slows the progress of the disease unless there is definite bronchial obstruction either from an inhaled foreign body or secondary stenosis.

H. Ballon, J. J. Singer, and E. A. Graham,¹ in a very complete review of the disease, state they are in general agreement with Brauer, who had never seen a patient with proved bronchiectasis respond to **Pneumothorax** treatment even though collapse might be almost complete. They suggest that it may have a definite place in treatment "in inflammatory conditions of the lung which are known to predispose or result in the development of bronchiectasis." These authors are not in a position to state whether **Oleothorax** will accomplish more than pneumothorax or other form of compression, but it does away with the necessity of frequent refills and allows the compression to be kept up for a much longer period.

The value of **Thoracoplasty** is assessed by groups of cases from different advocates of the operation, such as Sauerbruch, Hedblom, and others. The results have not been striking, but many of the cases were operated upon before full lipiodol investigation was possible. It is, however, an advantage rather than otherwise, when other measures are to be considered, that the chest is already partially collapsed.

When **Phrenicectomy** is considered as a solitary measure, it is hardly possible that it could cure the disease except in the very early stages, and the authors therefore say that "apparently an individual patient with bronchiectasis has only a small chance of being improved by the operation and, on the contrary, a definite chance of being made worse. Moreover, even when improvement occurs, it is usually not lasting."

Other operations, such as ligation of branches of the pulmonary artery and attempts at drainage by incisions in the lung, have long been known.

Graham's **Cautery Pneumectomy** is particularly advised either in those cases in which bronchiectasis is associated with multiple lung abscess or in chronic lung abscesses with secondary bronchiectasis. In addition, this operation is recommended to those suffering from unilateral types of bronchiectasis who have not responded well to the simpler forms of therapy, for whom thoracoplasty is either not indicated for various reasons or has failed to relieve the symptoms, and upon whom the performance of a lobectomy, although desirable, is unwise or technically impossible.

The last method for eradication of unilobar bronchiectasis discussed by Ballon, Singer, and Graham is **Lobectomy**. Various single- and multiple-stage operations are reviewed and the results discussed. It is quite apparent that the results of this operation are rapidly improving, and the operative mortality is coming down from 66 per cent to the neighbourhood of 12 per cent.

REFERENCE.—¹*Jour. Thor. Surg.* 1931, Dec., 154.

BRONCHUS, BENIGN TUMOURS OF. *W. H. Wynn, M.D., F.R.C.P.*

H. Wessler and C. B. Rabin¹ have studied 17 cases of benign tumour of the bronchus. Although in themselves benign, these tumours produce pulmonary complications which may result in the death of the patient, so that they possess a practical importance which outweighs their rarity. The commonest type is the adenomatous polyp (12 out of 17). These originate from the mucous

membrane of a large or main bronchus not far from its origin. They are pedunculated, with the free bulbous end directed towards the trachea as a consequence of their extrusion from coughing. The tumour is usually oval. If the pedicle is long, the tumour is movable and can act as a ball-valve and may obstruct the trachea or another bronchus. Microscopically the tumour is made up of rather small cells arranged in acini with definite basement membranes. The cells resemble those of the ducts of the mucous glands which are the probable site of origin. Fibromata, fibrolipomata, and enchondromata have also been described. Two-thirds of the cases occur before the age of 40. There is reason to believe that if its growth is slow a benign tumour may exist for years without any symptoms. Owing to its vascularity, however, hæmorrhages may occur unassociated with any other symptom. Hæmoptysis occurred in 12 of the cases and was usually frequently repeated. In one instance it was repeated for thirty years, and in a number for periods of one-and-a-half to five years. In this non-obstructive stage tuberculosis is usually suspected because of the hæmoptysis. The continued growth of the tumour eventually causes an obstruction of a large bronchus and the consequences of this are various. The first symptom may be an attack of pneumonia with or without pleurisy. It is assumed that the pneumonia was preceded by an atelectasis. Usually the pneumonia subsided and was succeeded by a stage lasting several months to six years during which there were no symptoms, or cough with blood-stained sputum. In 3 cases the initial symptom was a dry pleurisy or pleurisy with effusion, followed by a period of several years in which there were no marked symptoms. Purulent infection of the pleura occurred in three instances. This is usually a complication of the later stages and a direct consequence of suppurative disease of the lung. In such cases the tumour may not be suspected and only be found at autopsy. The inevitable termination of all cases is suppurative bronchiectasis and suppurative or indurative pneumonitis. In some cases anaerobic infection is added and the clinical picture becomes one of gangrene of the lung.

A unique form of dyspnoea is worthy of comment and may be regarded as pathognomonic. It is due to change of posture and is caused by the ball-valve action of a pedunculated tumour, which is displaced from its bronchus and obstructs the trachea. Partial occlusion may also produce a whistling or sonorous sound during respiration, which may be more or less constant and localized over the affected lobe. The hæmoptysis, which is the one characteristic symptom referable to the tumour itself, is very apt to occur suddenly without warning and without any other symptoms. It may cease just as suddenly and is not followed by subsequent staining of the sputum. When occlusion of a bronchus is caused X rays will show an area of atelectasis, usually lobar in distribution unless a main bronchus is obstructed, when the whole lung will appear cloudy. When infection has supervened the X-ray appearances are similar to those of pulmonary suppuration from other causes. Only bronchoscopic examination will give a certain diagnosis. This shows a smooth globular or oval tumour, which may be sessile or attached by a pedicle and so freely movable. The prognosis depends upon the early discovery and removal of the tumour through the bronchoscope. The complete removal at once may not be possible, and there is a tendency for the growth to recur after an interval of years. The pulmonary complications may require surgical treatment.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1932, Feb., 164.

BRUCELLA ABORTUS INFECTION. (See FOOD AND THE PUBLIC HEALTH; UNDULANT FEVER.)

BURNS.*Sir W. I. de C. Wheeler, F.R.C.S.I.*

Tannic Acid Treatment.—For the past eight years, a spray of 2½ per cent tannic acid solution has been almost universally used as a routine treatment of burns. The firm coagulum formed in the first twenty-four hours after spraying a burnt area needs no attention for several days. In the meantime the patient is usually free from pain. The separation of the coagulum commences at the end of the first week.

D. M. Glover¹ recommends the use of stronger solutions of tannic acid—5 per cent for children and 10 per cent for adults. The fresh solution is sprayed over the entire burnt area as soon as the area is prepared. With these stronger solutions, Glover states, quicker tanning of the damaged tissue is obtained. The tannic acid solution is sprayed over the burnt area every hour for the first twenty-four hours. If it is well coagulated and dry at the end of twenty-four hours, there is no further local treatment for several days. During this time the entire burnt surface is left exposed to the air. The most important part of the constitutional treatment is the adequate administration of **Fluids**. (Glover draws attention to the ease with which general cedema can be induced if too much fluid is administered during the first few hours in the case of extensive burns.) Between the sixth and eighth days some exudate begins to form beneath the crusts, as evidenced by a rise of temperature. Glover recommends the continued application of dressings soaked in **Dakin's Solution** at this stage. Large rolls of gauze wet with Dakin's solution are applied to the burned areas after the normal skin is protected adequately with sterile vaseline. Wool and oil silk is bandaged over the gauze to prevent evaporation. The dressings are moistened every four hours and changed every day. This type of dressing is continued until the coagulum is all off and the granulating areas are ready to graft. The initial application of the moist dressings is often accompanied by a rise of temperature, and the temperature swings irregularly until the coagulum and necrotic tissue are all removed. [Drainage by cutting away portions of the scab without moist dressings is as a rule better.—W. I. de C. W.]

W. C. Wilson² says that the basis of the modern treatment of burns is coagulation of the injured surface by tannic acid. This method has important local and general effects: (1) Local effects—It is rapidly analgesic. Pain, discomfort, and frequent dressings are avoided. In superficial burns, sepsis is absent and healing is rapid. (2) General effects—It lessens fluid loss from the body at the burned area. It prevents and minimizes acute toxæmia.

Management of Cases in Hospital.—In the case of a burn of small or moderate extent and without notable degree of shock, the patient is put to bed, and the bedclothes are supported by a 'cage', which contains electric lamp bulbs or other means of supplying artificial heat, and the area is exposed to the air. If pain is severe, **Morphine** or **Heroin** is given.

Cleansing.—The area is cleansed under general anæsthesia. The anæsthetic of choice is nitrous oxide and oxygen, but ether can usually be given with safety. Cleansing is done by first removing all epithelium which is loose or raised by blistering. Special care is necessary to remove any epithelium at the edges which is partially separated. The raw surface is *gently* swabbed, first with ether or alcohol, and then with a 1-1000 corrosive sublimate solution. Vigorous rubbing or scrubbing is unnecessary and harmful.

The coagulating solution is then sprayed over the raw surface from an atomizer of any form, and dried immediately by a current of hot air from an electric drier, or simply by heat from the bulbs in the cage. Spraying and drying are carried out at intervals of one hour, or less if desired. Seven to ten applications are sufficient in the great majority of cases; rarely more than

twelve are necessary. An alternative method to spraying is to cover the area with gauze and to soak this with the solution at frequent intervals, keeping it moist until a coagulum forms. The gauze is then removed. After the coagulum is formed, the parts are kept exposed to the air. In burns of the face and head it is necessary to protect the eyes, nostrils, and auditory meatus with moist wool during the spraying, which is the most suitable method for such lesions.

Coagulating Solution.—Various methods of inducing coagulation have been experimented with. The following solution is found to be most satisfactory; it practically eliminates the mild degrees of sepsis previously found in scattered areas and seems also to hasten coagulation. It is an aqueous solution of 2.5 per cent **Tannic Acid** and 1-1000 **Acridiflavine**. ~~Acridiflavine~~ **Acridine** was introduced originally as the result of a suggestion for first-aid treatment made by Dr. S. W. Fisher, H.M. Medical Inspector of Mines. Packets of powder are kept containing 7.5 grm. of tannic acid and 0.3 grm. of acridiflavine. A convenient amount of solution is made by dissolving such a packet of powder in 300 c.c. of warm sterile water. The solution should be made freshly for each case or occasion—not necessarily for each application.

Subsequent Care.—No special local treatment is necessary after the coagulum has formed. The area is exposed to the air and can be protected from trauma and soiling by ordinary care. Burns of the perineum are treated with the patient in the prone position or lying on a frame, such as Whitman's, with a space in the supporting canvas opposite the affected part. In uncomplicated cases the coagulum is allowed to separate itself. Frequently healing has become complete by the time it can readily be peeled off. Any raw areas left may be covered with a bland ointment dressing.

Sepsis.—In deep burns the same primary treatment is followed. Towards the end of the second week signs of sepsis under the coagulated layer develop, and are most manifest at the edges. It is necessary then to remove the coagulum. Different methods are advised for carrying this out. On the whole it is preferable to do so mechanically by cutting it away with scissors. It is occasionally convenient to remove coagulum together with sloughs under general anaesthesia.

The treatment described above is suitable for all types of thermal injuries and also for electrical burns.

Treatment at the Patient's Home.—The practitioner in favourable circumstances, with the help of a nurse trained in the method, may be able to follow fairly closely the method detailed before for the treatment of small or moderate burns. Otherwise the following plan can be adopted. The area is cleansed in the usual way under anaesthesia. Gauze soaked in the coagulating solution is applied to the raw surface and covered with wool and a bandage. The dressing may be left for twenty-four hours or renewed at twelve hours. A coagulum forms which can then be dried by exposure to the air for a short time. After the coagulum has formed, it may be exposed to the air continuously if means for its protection are available. Otherwise it should be covered by a dressing of dry gauze and a bandage. Subsequent treatment is as detailed above.

Successful treatment by tannic acid demands interest, care, and attention from those who employ it. They will be well repaid by the results.

E. I. Lloyd³ reminds us that prognosis depends upon the area burned and the age of the patient more than upon the depth of the burns. He states that toxæmia may follow with quite dramatic suddenness at a time when things seem to be going well. The condition depends upon absorption of protein including histamine from the burned area. His treatment may be outlined

as follows: For shock, **Morphia** hypodermically and **Fluids** by the mouth should be generously given. Two or three hours may often be advantageously spent before attending locally to the burns. In preparing the burned area for tannic acid treatment, the patient is anesthetized with gas-oxygen and the burned area carefully swabbed with ether. Dead and damaged tissue is snipped away with scissors, vesicles are opened and their outer wall removed. If pus forms beneath the scabs and fever reappears, Lloyd says that there is a temptation to resort to fomentations or other moist dressings. The proper treatment at this stage is to liberate the pent-up fluid by cutting channels in the coagulum with pointed scissors, and so providing drainage without moistening the scab. The patient remains beneath the electric-light cradle, which dries up the discharge and maintains body heat. The coagulum spontaneously separates in about two weeks. The exposed granulation tissue may be dressed with **Flavine** (1-1000), with **Paraffin**, or with **Sterile Vaseline**.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1932, May, 798, ²*Practitioner*, 1932, July, 183; ³*Brit. Med. Jour.* 1931, ii, 177.

CANCER. (*See also under various organs, etc.*)

CANCER, CHEMOTHERAPY OF.

Stanford Cade, F.R.C.S.

Treatment of neoplastic disease by means other than surgical or radiological has been the object of researches by biochemists, pathologists, and clinicians for many years. So far, medicinal treatment remains an ideal to be assiduously pursued. In reviewing the attempts made in various centres in such researches, one is dismayed at the disproportion between the magnitude of the effort and the insignificance of the achievement. Blair Bell¹ defines chemotherapy as "a treatment by synthetic preparations which have selective therapeutic action on abnormal tissues of the body." In practice these synthetic preparations can be grouped into two classes: (1) Organic chemical compounds most of which are poisons, and which are said to possess selective action on the cells of malignant disease. Of such substances the most extensive trials have been made with various compounds of lead, copper, and selenium. To be practicable they must possess a low degree of toxicity and a high selective action. This can be described as the 'chemotherapeutic index'. (2) The second group of substances are inorganic colloids or biological preparations from living tissues. They present a promising field of research. The most important contributions to the problems of chemotherapy of cancer since the publication of the last volume of the MEDICAL ANNUAL are those in connection with the serum treatment of lymphadenoma (*see HODGKIN'S DISEASE*) and on the influence of vital dye-stuffs and inorganic colloids on the resistance to transplantable tumours.

Vital Dye-stuffs and Inorganic Colloids.—Dr. R. J. Ludford,^{2,3} in the Tenth Scientific Report of the Imperial Cancer Research Fund, contributes a paper on the effect of vital dye-stuffs and of inorganic colloids on the resistance to transplantable new growths. The object of the research was to ascertain the effect of these substances upon the growth of transplantable tumours. Two sets of mice were used: in the first, normal mice were injected with suspensions of a tumour showing a natural tendency to regression; in the second, a partial immunity was established by previous injection of embryonic skin. The chemotherapeutic agents used were trypan-blue, vital-new-red, and colloidal aluminium hydroxide and sulphur. These different substances possess one property in common in that they are actively segregated by the macrophages which surround the tumour graft. In all the experiments the resistance to tumour growth was found to be diminished and no inhibitory action was

detected. The practical importance of these experiments lies in the selection of the material when colloids are tried as therapeutic agents for malignant disease. Unsuitable colloids may lead to aggravation of the malignant condition.

Effect of Trypan-blue on Metastasis.—In the same report of the Imperial Cancer Research Fund, Foulds studies the effect of vital staining on the distribution of metastasis in the Brown-Pearce rabbit tumour. If rabbits are injected intravenously with tumour emulsions, metastatic growths occur in a characteristic distribution as follows: kidneys (90 per cent), adrenals (70 per cent), eye (31 per cent), liver (18 per cent). Deposits are entirely absent from the spleen. If, however, the inoculated rabbits are also injected with trypan-blue, the spleen is no longer immune, and in 17 out of 30 animals it was found to be the site of metastasis; the incidence of deposits in the liver rose from 18 per cent to 82 per cent and in the lungs from 20 per cent to 76 per cent. The explanation offered is that the defensive mechanism normally present in the reticulo-endothelial system is destroyed by the presence of trypan-blue. The practical importance of this experiment lies in the warning that certain colloid agents should not be selected for chemotherapy of cancer, as they raise the incidence of metastasis by lowering the local protective mechanism.

Specific Protein Therapy.—From time to time reports are made of the beneficial effect of specific therapy by proteins, sera, or extracts of certain organs such as the adrenal or the pituitary. Although so far confirmation of the original results has never materialized, it is interesting to review a few selected contributions as it keeps alive the practitioner's interest in experimental treatment. In last year's MEDICAL ANNUAL (p. 95) the effects of Pituitarin (W. Susman⁴) were reviewed; although the original contribution showed some promise, no confirmatory results have been obtained. F. W. Riches⁵ attempted to verify the original encouraging results. In a small group of cases, selected as suitable for observation, of proved malignant character, the treatment by pituitarin was systematically carried out. Riches comments that in the cases treated no beneficial effect which could be attributed to the injections of pituitarin was observed, in no case was life prolonged, nor was there regression of any of the growths. The reviewer can fully confirm Riches' findings.

The effect of an extract of **Suprarenal Cortex**, prepared by Coffey and Humber, was fully investigated at the Kellogg Foundation. In an independent report, R. H. Harris⁶ analyses the effects of the treatment in 415 patients treated at the experimental clinic. With few exceptions, the patients were incurable by either surgical or radiological means; the diagnosis of malignancy was established by histological examination, X rays, or exploratory operation, and in many cases by subsequent autopsy. Coffey and Humber hold that extract of suprarenal cortex supplies a principle lacking or deficient in patients with malignant disease, and made claims which eventually led to the investigations described. Harris's conclusions are that no tumour of any patient was observed to disappear either spontaneously or as a result of use of the extract; and that cure of malignant disease cannot reasonably be expected to occur as a result of the use of suprarenal cortex extract.

REFERENCES.—¹*Practitioner*, 1931, Aug., 225; ²*Brit. Med. Jour.* 1932, Oct. 23, 766; ³*Imp. Cancer Res. Fund*, 10th Sci. Rep. 1932; ⁴*Brit. Med. Jour.* 1931, Oct. 31, ⁵*Ibid.* 1932, May 14; ⁶*Jour. Amer. Med. Assoc.* 1931, Nov. 14.

CANCER, ELECTROCOAGULATION IN.

Sir W. I. de C. Wheeler, F.R.C.S.I.

A. E. Tyler¹ gives a concise description of this procedure. In applying the high-frequency current to cancer tissue, the aim of the surgeon should be to coagulate the tissue until it turns a dirty grey colour but is not charred. The

coagulated mass can then be curetted away immediately, and further coagulation performed until the growth has been entirely removed. It is a bloodless operation. If an artery seems apt to bleed, it can be picked up with a forceps and the current passed through the instrument, which is then removed, and thus the work is unhampered by a collection of forceps.

In cases of small cancers of the tongue, electrocoagulation converts a difficult major operation into a minor affair. The operation can be done with local anaesthesia. Bloodless dissection can be effected by using a pointed electrode. The malignant mass can be rapidly dissected from the surrounding tissue. Electrocoagulation works so rapidly and so easily that the beginner is apt to err on the side of omission. It is necessary to combine curettage with electrocoagulation. "Coagulate what appears to be enough, immediately curette as far as possible without producing bleeding, and if cancer tissue remains repeat the process."

REFERENCE.—*Med. Jour. and Record*, 1931, Sept 16, 284

CANCER, RADIUM TREATMENT OF.

Stanford Cade, F.R.C.S.

In February, 1932, the Canadian Royal Commission on the use of Radium and X Rays issued a comprehensive and accurate report¹ on the whole question of radiation therapy. After reviewing the conditions existing at the moment in most European countries and in the United States of America, the Commission concluded that the views of the highest authorities on this subject coincided to a remarkable degree. The conditions necessary for carrying out satisfactory radiotherapy in cancer are expressed in the words of Dr. Gosta Forssell, Director of the Radiumhemmet of Stockholm. He asks the question, "Why has radiotherapy, and particularly radium therapy, in most parts of the world produced such poor results that the capacity of radiotherapy to effect a lasting cure in malignant tumours has been generally doubted?" He answers the question as follows:—

The chief cause of this is the splitting up of radiotherapy which has occurred in most places. Radium has been distributed for use in various clinics without any proper control as to whether sufficient experience existed there, either in respect of radium or Röntgen therapy, and without sufficient resources always being available to carry through radiotherapy in a satisfactory manner. The treatment and the following up of the results of the treatment in one and the same case have also not infrequently been split up amongst many hands, so that the same medical man has not looked after the radiotherapy and been responsible for the issue.

Until quite recently the arrangements for the radiotherapy of tumours were not properly organized. Cancer patients in need of radiotherapy were sent either to radiological institutions which were best equipped for radiotherapy, or to surgical clinics which were earlier the only clinics able to afford any help in cancer. The radiologists, however, had often not a great deal of experience in the clinical pathology of tumours, and did not possess their own clinics for the study of radiotherapy of tumours. The surgeons, on the other hand, had often neither sufficient knowledge and training in radiotherapy, nor the necessary resources for carrying out the same.

In the combined surgical-radiological treatment of tumours the surgical interference has been looked upon as of main importance, and radium or Röntgen treatment as a more or less negligible adjunct. In reality radiotherapy is the chief treatment in all those cases of cancer where the tumour cannot be removed with safety. The skill in its use decides the patient's fate, and surgery in these cases is only an auxiliary, although often a very important one. This circumstance has not been clearly understood hitherto, and until

it is, the combined surgico-radiological treatment is doomed to failure. To this must be added another important circumstance. A surgeon who only deals with radiotherapy as a side-line is mostly, as a matter of course, chiefly interested in surgery, and, possibly, in radium application during operation. All the rest of radiotherapy of malignant tumours, comprising about 75 per cent of the entire scope of radiotherapy, is of minor interest to him. The surgical clinics have their special task; they want for this purpose all their accommodation. Experience goes to prove that in order to obtain perfect treatment at a radiotherapeutic clinic for cancer patients, it is necessary that it should be in charge of specially qualified medical officers who have undergone a long training and devoted themselves to radiotherapy, and have plenty of time not only for the current work but also for scientific studies. Organized co-operation must take place between the surgical clinic and its special departments on the one hand and the radiotherapeutic clinic on the other.

ANALYSIS OF RESULTS OF RADIOTHERAPY.

Taking into consideration only those clinics which have adequate equipment, trained staff, and unimpeachable statistics, the true position of radiation as a method of treatment of cancer can be estimated with a great degree of accuracy.

Carcinoma of the Cervix Uteri (see also UTERUS).—At the Centenary Meeting of the B.M.A.² in July, 1932, the following results were shown:—

Professor Friederich Voltz (Munich).—In the thirteen years 1913–26 inclusive, 1866 cases of cervical carcinoma were admitted to the clinic. Of these, 143 (7·7 per cent) were not treated, most of them because they were hopeless, sometimes moribund. For statistical purposes, therefore, the number of cases is 1723. Of these, 319 patients were alive and well after five years. According to the classification recognized and adopted by the Radiological Commission of the Hygiene Section of the League of Nations, the following is the group result (*Table I*).

Table I.—1723 CASES OF CARCINOMA OF THE CERVIX (1913–1926).

GROUP	NO. IN GROUP	NO. OF 5 YEAR CURES	PERCENTAGE
I—Operable cases	326	141	43·2
II—Borderline cases	401	90	22·5
III—Inoperable cases	672	81	12·1
IV—Incurable cases	324	7	2·1

The period under review in *Table I* includes the beginning, development, and perfection of the radiological technique. The present-day possibilities, however, are represented more accurately in *Table II* for the period 1924–6, and the subsequent 5-year survival. This includes a total of 404 cases of carcinoma of the cervix.

Table II.—404 CASES OF CARCINOMA OF THE CERVIX (1924–1926).

GROUP	NO. IN GROUP	NO. OF 5-YEAR CURES	PERCENTAGE
I—Operable cases	99	49	49·4
II—Borderline cases	91	21	23·1
III—Inoperable cases	120	23	17·9
IV—Incurable cases	85	4	4·9

Professor Voltz concluded his communication to the British Medical Association by the remark that "success depends, however, on possessing the proper means and using them in the proper way."

Dr. Lacassagne (Radium Institute, Paris).—The total number of patients treated by radiation for carcinoma of the cervix at the Paris Radium Institute between 1919 and 1926 was 678. Of these, 182 (26 per cent) were alive and free from all symptoms of cancer five years after the date of treatment. The percentage of cures varies from year to year, suggesting a constant improvement in results, explained by the progress in radiotherapeutic technique. *Table III* shows the comprehensive status of the 678 cases at the end of the fifth year of treatment.

Table III.—678 CASES OF CARCINOMA OF THE CERVIX (1919-1926).

YEAR	TOTAL NUMBER OF PATIENTS TREATED	CURED FOR 5 YEARS	PERCENTAGE OF CURES
1919	103	11	10
1920	98	17	17
1921	48	12	25
1922	69	18	26
1923	85	26	30
1924	80	28	35
1925	97	34	35
1926	98	36	36
Totals	678	182	26

Dr. Lacassagne concludes that in the advanced stages of the disease it is permissible to hope that a greater percentage of cures will be obtained when the 8-grm. bomb under construction is available.

Table IV shows the relative results of cures in various centres.

Table IV.—2115 CASES OF CARCINOMA OF THE CERVIX.

CLINIC	TOTAL NO OF TREATED CASES	RELATIVE OF OPERABLE CASES	ABSOLUTE CURES
		Per cent	Per cent
Radium Institute, Paris	430	80.5	26.2
Radium Institute, London	350	20	12.5
Memorial Hospital, New York	578	41	18.5
Radiumhemmet, Stockholm	737	All inoperable	23.1

Carcinoma of the Breast (*see also* BREAST, SURGERY OF).—Geoffrey Keynes³ gives a full account of 171 cases of primary cancer of the breast treated by interstitial radium treatment (needling). Statistical analysis of these cases by Dr. Janet E. Forbes (Lane-Claydon) gives the results shown in *Table V* in patients treated more than three years ago—46 cases.

The striking feature of this analysis is the number of 3-year survivals in inoperable cases—namely, 46.1 per cent. Here the value of radiation is clearly superior to other methods of treatment. Geoffrey Keynes' conclusions can be summarized as follows:—

1. In general the results of radium treatment compare favourably with those obtained by any other form of treatment, such as pure surgery. In the most successful cases the patients are virtually normal women, and their expectation of life is at least as great as if they had been subjected to a mutilating operation.

Table V.—46 CASES OF CANCER OF THE BREAST.

GROUP	TOTAL CASES	ALIVE 3 YEARS	DIED OF CANCER	PERCENTAGE ALIVE AT 3 YEARS
I—Operable, no palpable glands ..	9	7	2	77.7
II—Operable, palpable glands ..	11	4	5	36.3
III—Inoperable	26	12	13	46.1

2. No exaggerated claim is made for radium treatment, as that it should be used to supplant surgery. It is claimed, however, that radium ought to have a definite place in the treatment of carcinoma of the breast, and should often be used instead of, or combined with, surgery, according to individual circumstances.

3. The place of radium in the treatment will vary according to the stage of the disease and with other circumstances. For very advanced or for inoperable tumours radium treatment is the treatment of choice. Remarkably good results can sometimes be obtained in apparently hopeless conditions.

Geoffrey Keynes, however, deals in his communication solely with the interstitial method of treatment (needling). The two-stage method of treatment as advocated by Stanford Cade, described in the MEDICAL ANNUAL for 1930 (p. 96), offers a more complete and uniform irradiation of a large area. It can be termed the 'radium Halsted', as it covers a wide field of primary growth, lymphatic area, and the normal tissues in the vicinity. This method has been used by Cade in over 250 cases of breast cancer (primary and recurrent after operation) with satisfactory results, which show a definite improvement in prognosis, particularly in those cases which are beyond surgical aid but which have not yet metastasized. It is obvious that in the case of the breast, as in all malignant diseases, the ultimate prognosis depends upon the stage of the disease when treatment is first applied. Radium, having a purely local action, can only deal with the local condition. Dissemination is neither prevented nor accelerated by radiation.

Oral Cancer.—In the Eighth Report of the British Empire Cancer Campaign the following results obtained at the Westminster Hospital are recorded by Stanford Cade.⁴ In cases of cancer of the tongue there was a survival rate in inoperable cases of 11 per cent after five years, 18 per cent after four years, and 26 per cent after three years. At the Radiumhemmet in Stockholm the results were as follows: with radiological treatment only, cases of cancer of the mouth without glandular metastasis showed a 5-year survival rate, free from symptoms, in 31 per cent of cases. Of the total number of oral cancer cases there was a survival rate of 18 per cent.

The most notable advance in the treatment of cancer in the mouth by radium has been achieved by the adoption of mass radiation to certain types of *malignant tonsillar tumours*. The improvement is so remarkable that it deserves the closest attention from the clinician. Ellis G. Berven⁵ compares the results obtained by the old method with those given by the new method, namely, irradiation with a mass of 8 grms. of radium at a distance.

The comparison of Table VI and Table VII shows that, whereas with the old methods (small doses) there was not a single survival for either two or three years, the results with the new method (8-grm. bomb) show 44.4 per cent survival free from disease for two years and 38.9 per cent of survival free from disease for three years. This is certainly the most notable advance in radium therapy in oral cancer in the past two years.

Table VI.—TONSILLAR CANCER TREATED BY THE OLD METHOD.

GROUP	PRIMARY HEALING	FREE FROM SYMPTOMS, 1 YEAR	FREE FROM SYMPTOMS, 2 YEARS	FREE FROM SYMPTOMS, 3 YEARS
	Per cent	Per cent	Per cent	Per cent
I	50	16.7	0	0
II	28.5	14.3	0	0
III	13.3	6.7	0	0
^a Total	25	10.7	0	0

Table VII.—TONSILLAR CANCER TREATED BY THE NEW METHOD. (3-GRM. BOMB).

GROUP	PRIMARY HEALING	FREE FROM SIGNS AND SYMPTOMS, 1 YEAR	FREE FROM SIGNS AND SYMPTOMS, 2 YEARS	FREE FROM SIGNS AND SYMPTOMS, 3 YEARS
	Per cent	Per cent	Per cent	Per cent
Carcinoma I ..	66.0	66.6	66.6	50.0
" II ..	100.0	100.0	50.0	50.0
" III ..	0.0	0.0	0.0	0.0
Total carcinoma	42.8	42.8	35.7	28.6
Lympho-epithelioma II	100.0	75.0	75.0	75.0
Total carcinoma and lympho-epithelioma	55.6	50.0	44.4	38.9

Mass Radiation.—The question of the utility, advantages, and dangers of this method of radiation was investigated during the past year by a Technical Committee appointed by the Presidents of the Royal Colleges of Physicians and Surgeons. The investigation consisted of the evidence obtained from personal observations of members of the committee and from visits to various centres in London, Manchester, Birmingham, Paris, Brussels, Stockholm, and New York. The committee conclude⁶ that the evidence is convincing that the treatment of cancer by radiation from a massive radium unit is a method the value of which has already been proved, although so far only in a limited field. How far these limits can be extended is a question which can be solved only by co-ordinated clinical, experimental, and physical research in which this country ought to take its share. The larger the unit available, the more rapidly will its possibilities be discovered and the wider will be the field which can be explored.

Effect of Irradiation on Human Tissue.—Dr. Beatrice D. Pullinger⁷ investigated by histological studies of irradiated tissues the effects of radium on various tumours and the normal surrounding structures. A review of her observations reveals the fact that although direct injury to individual cells can be demonstrated, it is found that when vascular tissues are exposed to radium or X rays an essential part in the cellular reaction is played by blood-vessels. A regular series of events occurs in blood-vessels. Dr. Pullinger stresses the importance of the vascular reaction because it appears to her that as a cause of cell-death it predominates over any possible direct injury under conditions of therapeutic irradiation. She concludes that in living vascular tissues as opposed to *in vitro* preparations and young embryonic cells hyperæmia is an essential reaction

to therapeutic irradiation. Thin-walled loosely supported capillaries and veins are most readily affected, and react in deep structures as well as at surfaces. All effects following irradiation are related to vascular stimulation and vascular degeneration. In the reviewer's opinion, however, these facts do not entirely explain the cause of cell-death in irradiated tissues. They represent, no doubt, accurate observations as made in histological studies. The importance of vascular changes is great and is responsible for the skin reactions (erythema), mucosal reactions (formation of fibrinous films), and later telangiectasis and at later stages radio-necrosis from obliterative endo-arteritis. That there is, however, a direct action on the power of cell-division, which varies with the different types of cells and their rate of growth, is evidenced by the different response of various tissues to the same type of radiation, by the variation of response according to the time interval in prolonged treatments, by the arrest of mitosis and rapid disappearance of some growths, and by the relatively complete absence of response in such benign tumours as lipomata and adenomata. The effects of radiation must be considered to date to be multiple in nature, both direct and indirect, and the response to treatment depends as much on the state of the stroma of the healthy tissues as on the nature of the tumour cell.

Effect of Anæmia on the Reaction to Radiation.—It has been observed for many years that radiation treatment in anæmic patients was productive of less satisfactory results than could be anticipated in any particular group of patients. It was also known that local anæmia, such as is the case in the presence of œdema, is an added difficulty to successful radiation therapy. The effects of anæmia were investigated experimentally by J. C. Mottram and A. Eldinow.⁸ They used the tail of a rat, and found that if the tail was blanched before irradiation by winding rubber tubing up it and kept blanched during the period of radiation by a ligature at the base, then the subsequent skin reaction was much less than when a normal tail was radiated. On the other hand, when the tail was made hyperæmic by being subjected to cold at 0° C., then the skin reaction following radiation was increased. It appears, therefore, that a diminished blood-supply results in a diminished radio-sensitiveness. Bleeding of rats immediately before radiation renders the skin and the tumour Jensen rat sarcoma less sensitive to radiation than normal skin or tumour in unbled animals. The clinical bearing of these experiments is clear and important; they support the clinical experience that anæmic patients do not respond well to irradiation, and that tumours with a poor blood-supply react badly to radiation. It follows that before treatment with radiation every endeavour should be made to improve the patient's blood-count, and that such damage to the blood as may be caused by the treatment is to be vigorously counteracted by medicinal means, including, when necessary, blood transfusions.

Pain as an after-effect of Radium Treatment.—Prompted by the observation that some medical men regarded post-irradiation pain as so serious a complication that it negated the possible benefits of the treatment, R. S. Pilcher⁹ examined a series of cases treated by radium in which pain was a prominent symptom, with a view to determining if any relation could be established between the symptoms and the treatment. From a very careful, detailed, and critical analysis of all cases in which pain was a prominent symptom, Pilcher draws the following conclusions: (1) Radium treatment is able to relieve deep-seated and referred pain due to malignant disease; (2) The only painful sequelæ that can be attributed solely to radium are (a) radium-necrosis, (b) direct injury to nerves; (3) In some cases temporary arrest of a tumour is obtained without relief of pain, and the suffering of the patient is prolonged; (4) By increasing the fibrous tissue reaction to a growth radium may aggravate pain due to pressure

on nerves ; (5) The only factor in treatment that seems constantly to determine a painful sequel is such gross overdosage as to produce radium-necrosis ; (6) There is no evidence that repeated treatment is harmful—much less that it is useless—provided that the total dose is not such as to produce necrosis.

These conclusions emphasize two important points—namely, that the chief cause of pain is necrosis and that repetition of radium treatment is possible. Radium necrosis being a painful and in most cases an avoidable complication, both depressing to the patient and humiliating to the radium therapist, all possible means for its prevention ought to be put into practice. The most important factor in interstitial therapy is adequate screenage. Primary screenage of at least 0.8 mm. of platinum offers a definite additional safeguard against necrosis over the usual but inadequate 0.5 mm. of platinum filter. Additional filtration obtained by metals of medium atomic weight further increases the safety factor. In cavitary and surface radiation, in addition to primary metallic screenage by platinum, secondary screenage by rubber can be employed. In mass radiation, distance, multiplicity of ports of entry, and splitting of the time factor all diminish the risk of necrosis. The second important observation by Pilcher, which is supported by other observers, is that repetition of treatment is possible. It must, however, be emphasized that definite evidence of local recurrence or of persistence of the disease must be quite clearly established prior to a repetition of radium treatment. This is emphasized so as to avoid the disastrous results which occur when a delayed radium burn is submitted to further irradiation under the false impression that the lesion is a neoplasm. It is also known that repeated treatments are less effective than the initial treatment, and greater experience is required to assess the dosage and to select the type of radiation and the actual technique the treatment.

Effect of Radium on Precancerous Skin Areas.—A practical point in the therapeutic use of radium in malignant disease is dealt with by Dr. Cramer¹⁰ in the Tenth Scientific Report of the Imperial Cancer Research Fund. Experimental observations of the effect of radium on precancerous skin areas were made in a set of 120 mice. The mice were painted with tar twice a week, and the painting was stopped before the appearance of warts. Normally, mice so painted with a known carcinogenic tar develop lesions—at first benign warts, which later become malignant. This sequence of events is very constant, so that an area so treated can be quite accurately described as precancerous—namely, one in which a malignant growth is likely to develop in a high degree of probability. Cramer¹¹ carried out a series of experiments consisting of the irradiation of such precancerous areas with radium in therapeutic doses. His conclusions are as follows: the application of radium to a precancerous area of skin delays and even inhibits the development of malignancy. This effect is most marked where the precancerous conditions are least advanced, and the dose of radium relatively large. No evidence of any kind was obtained that radium in the doses given had the effect of breaking down the resistance of the skin to the development of malignancy. The application of radiotherapy in carefully graded doses to precancerous conditions in man is, therefore, strongly indicated as an effective measure for delaying and even preventing the development of malignancy. Further, when radiotherapy is applied to a fully developed malignant tumour in man, the possibility must be considered that a much larger part of the tissue or organ has been subjected to chronic irritation than that portion in which the malignant growth has developed, and that therefore even the apparently normal parts may be in a precancerous condition. For this reason the application of radiotherapy should extend over a much wider

area than the malignant growth and its immediate neighbourhood, in order to retard or even prevent subsequent development of a new malignant growth from the precancerous cells:

REFERENCES—¹*Rep. Roy. Com. Uses of Rad. and X-ray*, Toronto, 1932; ²*Brit. Med. Jour.* 1932, Nov. 19; ³*Brit. Jour. Surg.* 1932, Jan., 415; ⁴*Brit. Emp. Cancer Campaign, Annual Rep.* 1931; ⁵*Acta Radiol.* 1931, Supl. xi; ⁶*Brit. Med. Jour.* 1933, Jan. 7; ⁷*Jour. Pathol. and Bacteriol.* 1932, xxxv; ⁸*Brit. Jour. Surg.* 1932, Jan., 481; ⁹*Lancet*, 1931, Nov. 28; ¹⁰*Imp. Cancer Res. Fund*, 10th Sc. Rep.; ¹¹*Brit. Jour. Radiol.* 1932, v, No. 56.

CARDIOSPASM. (See OESOPHAGUS, DISEASES OF.)

CARDIOVASCULAR SYPHILIS.

A. G. Gibson, M.D., F.R.C.P.

In a review on the diagnosis and treatment of syphilis of the aorta and heart, Carey F. Coombs¹ enlarges those aspects of his Lumleian Lectures reported in last year's MEDICAL ANNUAL (p. 226). He suggests that syphilis is a cause of crippling and death which bulks substantially in cardiovascular disease. In Great Britain it may be up to 10 per cent, and in the United States up to 15 per cent. The outlook when the diagnosis is made easily is almost desperate, and the average expectation of life probably not more than five years. There are records of aortic regurgitation for as long as eighteen years, but this is exceptional. Indeed, it is probably by cardiovascular disease that syphilis is most lethal. Aortitis is the most common lesion, and in Turnbull's post-mortem series was found four times as often as scarring of the aortic cusps. The action of the spirochæte from the mediastinal lymphatics through the vascular adventitia is discussed, and its action on the orifices of the coronary arteries with a consequent tendency of portions of the cardiac wall to become fibrotic. Syphilis has the capacity of lying latent in the body and of killing at the end of one or two decades. Coombs makes the statement that in all probability the aorta of every person infected with syphilis has suffered a certain amount of damage within a year or so of infection. However carefully the source of syphilis may be watched, neither symptoms nor signs of aortic disease are recognizable until about fifteen years after the primary infection. The shortest period on record is six years. In Turnbull's series it varied between eight and twenty-five years. Symptoms as a rule appear before signs, and the commonest is dyspnoea, usually associated with the ventricular defeat of chronic hyperpiesis. In one series about one-third of the patients complained of anginal pain, and the writer has had a case of pain on swallowing as the first symptom. There are two exceptions to the rule that symptoms precede signs: (1) Those patients who die suddenly; and (2) Those who come under observation for some other syphilitic lesion. This last class is important in so far as dilatation of the aorta may in them be detected before the valves have become incompetent, for when these have begun to leak the chance of much good by treatment is small.

DIAGNOSIS.—In diagnosis of dilated aorta Coombs refers to the following points: increased dullness at the site of the manubrium sterni by careful percussion both down and across; an emphatic second sound, the 'bruit de Tabourka', especially if this is accompanied by a low blood-pressure; alteration in the blood-pressure as between the two upper limbs; and finally the widening of the aortic shadow by X rays. From the X-ray appearances alone aortic syphilis may be suspected when there is diffuse dilatation without the corresponding enlargement of the heart, when the aortic shadow is dense and high in the chest in a relatively young subject with high blood-pressure, or when there is a localized dilatation and increase of blood-pressure.

In the matter of diagnosis J. E. Moore, J. H. Danglade, and J. C. Reisinger³ come to practically the same conclusions as Coombs, and mention that in a patient with known late syphilis, with or without a positive Wassermann reaction of the blood, there is strong evidence for the diagnosis of syphilitic aortitis if three of the following signs are present: X-ray dilatation of the aorta, increased retromanubrial dullness, the history of circulatory embarrassment, bell-like second sound, substernal pain, or paroxysmal dyspnoea. Coombs declares that a man of middle age with the signs of myocardial disease without obvious cause should be suspected of syphilis. A small percentage of cases with complete heart-block, perhaps 10 per cent, is syphilitic, and a smaller percentage of bundle branch block cases. Cardiac infarction is rare, and in less than 2 per cent of a series was auricular fibrillation caused by syphilis. In 21 per cent, however, of Parkinson's and Clarke Kennedy's cases of heart failure with normal rhythm there was a syphilitic basis.

TREATMENT.—The effect of treatment of syphilitic focal myocarditis is good, especially prolonged treatment by **Potassium Iodide**. This drug also has the reputation of relieving the pain of syphilitic aortitis. Full anti-syphilitic treatment for all lesions is desirable when possible, including the use of the **Arsenical Preparations**. But the problem of healing syphilitic lesions of this type is more than the killing of spirochaetes.

J. E. Moore, J. H. Danglade, and J. C. Reisinger³ discuss the prolongation of life that can be obtained as the result of treatment, based on a study of 43 patients with aortic aneurysm, 90 with aortic insufficiency, and 8 with various other forms of syphilitic heart disease. They remark on the efficiency in prophylaxis of thorough treatment in the early stages of syphilis. Of 117 patients who had thus been treated, not one presented any evidence of cardiovascular disease, while 24 of another series of 285 patients showed signs of one or other form of cardiovascular disease. Their conclusions are, therefore, that modern antisiphilitic treatment is probably not the cause of the apparent increase in the incidence of syphilitic aortitis. They found that of patients with aneurysm 98 per cent have a positive Wassermann reaction, and 96 per cent of those with aortic regurgitation.

In patients with aortic regurgitation who received little or no treatment the mortality was 91 per cent, and the average duration of life was thirty months, whereas in the well-treated patients the mortality was 16 per cent and the average duration of life seventy-one months. The authors refer to the symptomatic relief given by antisiphilitic treatment, and the opinion is expressed that this relief is in direct proportion to the amount of treatment given. Restoration of capacity to work is much more likely if proper treatment is given. The old salvarsan ('606') should not be employed in cases of aneurysm or aortic regurgitation, and in those patients with neurosyphilis **Tryparsamide** is recommended. As an indication of progress in treatment the authors discard the Wassermann reaction, which usually becomes fixed.

R. Hift,⁴ from a study of 231 cases of syphilitic aortitis, infers that after symptoms have once become manifest the fate of the patients is largely dependent on whether he receives antisiphilitic treatment or not. Under this treatment the symptoms disappear and a complete clinical cure is possible. Moreover, it checks the progress of the disease. In general, if the aorta appears wide, the prognosis is favourable; if narrow, unfavourable.

F. Kisch,⁵ however, believes that the aorta is not saved from the syphilitic process by the modern arsenic therapy, though it counteracts the infectiousness and prevents the spread to a certain extent. He is against the ordinary

arsenical therapy in syphilis of the aorta complicated with myocarditis, and advises cardiac stimulants, such as **Digitalis** with **Mersalyl** (salyrgan), and, later, treatment with **Sodium Iodide**.

(See also CORONARY ARTERY DISEASE.)

REFERENCES.—¹*Quart Jour Med.* 1932, Jan., 179; ²*Arch. of Internal Med.* 1932, May, 753; ³*Ibid.* June, 879; ⁴*Abstr. in Jour. Amer. Med. Assoc.* 1932, April 9, 1341; ⁵*Ibid.* 1931, Sept. 12, 818

CATARACT.

W. S. Duke-Elder, M.D., F.R.C.S.

Intracapsular Extraction of Cataract.—The very great operative experience and the excellence of his results make it worth while to note the opinion of A. Elschnig¹ (Prague) on the ideal operation for senile cataract. For many years he has practised the intracapsular method of extraction and in a recent paper has summarized his technique. He takes minute precautions to ensure sterility in the conjunctival sac, irrigating both the conjunctiva and the lacrimal sac with mercury oxycyanide and applying a yellow oxide of mercury ointment until swabs on two consecutive days show the eye to be clean. Prior to the operation as much care is devoted to the anaesthetization and immobilization of the eye. The general anaesthesia of the globe is induced by a 8 per cent solution of cocaine. The muscles of the lids are then immobilized by injecting a 2 per cent solution of procaine hydrochloride-epinephrine into the subcutaneous tissues over the outer half of the zygomatic arch, thus paralysing the facial nerve; 1 c.c. of the same solution is then injected retro-orbitally, the needle being inserted through the skin at the outer and lower angle of the orbit. In addition, in sensitive and nervous patients a subconjunctival injection of 2 per cent cocaine is made into the upper equatorial region of the globe, care being taken to avoid the tendon of the superior rectus. Finally a stay-suture is inserted into the tendon of this muscle in order to steady the movements of the eye. If necessary, in order to secure complete immobility a canthotomy may be done.

Sutures are then placed in a conjunctival flap and the corneal incision is made. This latter involves the upper two-fifths of the arc of the normal limbus, but if the cornea is small, it is larger. The conjunctival flap is then lifted with forceps, the anterior chamber is opened, and a small slit made in the iris close to its root with the de Wecker scissors. Using the author's own capsule forceps the capsule of the lens is then grasped at the lowest available part of the dilated pupil, and the lens gently rocked from side to side for about eight or ten seconds. Thereafter it is raised in the forceps so that its lower edge is brought forward and upwards through the pupil, the whole lens being tumbled over so that its lower part engages in the wound. This manoeuvre is aided by pressure with a hook against the cornea on the level of the lower edge of the dilated pupil. Immediately thereafter the wound is closed by tying the prepared suture, and finally a repositor is inserted underneath the flap and the iris replaced into position. Eserine is then instilled into the eye, the wound touched with a 5 per cent tincture of iodine, an ointment of eserine oxycyanide instilled, and a bandage applied.

Elschnig considers that such an intracapsular operation is indicated in about 80 per cent of all cases of cataract, while it is quite the safest in cases of immature or posterior cortical cataract. It is not, however, applicable to cases of intumescent cataract. In old patients, in the adipose, and those with chest complications, or in other cases wherein a prolapse of the iris may be expected, an iridectomy should be performed in place of a simple incision of the iris; but the author considers that in cases of high myopia this step is contra-indicated.

Glaucoma after Cataract Extraction.—A very informative case illustrating one of the causes of hypertension after cataract extraction has been studied histologically and experimentally by M. Carrado.¹ The case is reported of a patient operated on for cataract, whose eye remained red and painful, and became blind a few months later. The corneal epithelium was rough, and one deep infiltrate was present. The site of the corneal incision was marked by a deep furrow, and the iris was adherent to the cornea. The tension was very high, and the eye was enucleated on account of pain. Sections showed an ingrowth of corneal epithelium covering the two edges of the corneal wound and lining the anterior chamber, except where the iris and cornea were in contact. Mitoses were seen in the newly formed epithelial lining.

The author attempted to study the conditions necessary for such epithelial ingrowth by animal experiments. Incisions in the cornea were made, through which a flap of conjunctiva was introduced into the anterior chamber, but this was always absorbed within two or three weeks without any growth of epithelium in the chamber. The same was true with corneal flaps treated in the same way. When, however, a similar flap was separated from one lip of the wound by a piece of celluloid held in place by two notches, the epithelial flap remained intact. The celluloid was removed in two weeks, and the flap remained adherent to the iris. The same was true when a flap of cornea was placed on the capsule of the lens, with its epithelial side forward. Sections showed the epithelium and corneal tissue to have proliferated to form cystic cavities in the anterior chamber, lined with epithelium. In one eye the corneal tissue had grown so as almost to fill the cystic space. The author believes that when the wound remains open unusually long after the cataract operation, the resulting hypotony with increase in the albumin of the aqueous provides favourable conditions for growth of the epithelium through the open wound and in the anterior chamber.

REFERENCES.—¹*Zeits. f. Augenheilk.* 1931, lxxv, 1; ²*Ann. di Ocul.* 1931, lxx, 706.

CEREBRAL DIPLEGIA.

Reginald Miller, M.D., F.R.C.P.

It is a curious thing that the very common and obvious condition of cerebral diplegia tends to remain in the minds of medical students and practitioners as something advanced and rare. This is probably due to the fact that a great proportion of the cases of this disorder is confined in institutions; but whatever may be the cause of this mental attitude, it tends to result in a lack of interest in, or at least of grip on, this disorder. This is regrettable, for the mental deficiency which so often accompanies cerebral diplegia is different in type from the ordinary, as seen, for example, in mongolism. Cerebral diplegia is due to organic lesions in the brain, and the degree of mental and physical incapacity depends upon the extent and situation of those lesions; but—and this is the point—the unaffected parts of the brain are normal. Hence the interest in the treatment and training of these children should be keen and sustained.

R. Ironside,¹ in discussing the classification and prognosis in cases of cerebral diplegia, agrees with the commonly accepted view that the commonest changes in the brain are of the type of atrophic sclerosis. These changes may be diffuse, producing the so-called walnut brain, or localized, or scattered. The cerebellum may be affected as well as the cortex and other parts of the cerebrum. C. A. Patten² has also investigated the origin of cerebral diplegia from the point of view of birth injuries, and comes to the conclusion that "the frequent occurrence of bilateral motor involvement, together with defect in intelligence, indicates something more than the effects of trauma or vascular accidents in the neurologic conditions of the new-born infant. There exists

probably a developmental defect or arrest which concerns either the integrity of the cortical cells or the proper myelinization of the corticospinal tracts and association fibres." The work of J. Collier in combating the old idea that cerebral diplegia was due to birth injury will be remembered.

CLASSIFICATION.—Ironside classifies the types of cerebral diplegia as follows : (1) Cortical types, usually symmetrical, and giving rise to spastic paraplegia and diplegia. To these may be added squints, blindness, and bulbar symptoms. (2) Striatal types, again usually symmetrical, and showing bilateral choreiform or athetotic movements. (3) Cortico-striatal types, often asymmetrical, a combination of the two former groups. (4) Cerebro-cerebellar types, showing ataxia, cerebellar speech, nystagmus, and atonia. To these groups must be added various transitional types.

PROGNOSIS.—Ironside pleads strongly for the individual study of each case, and has found in his work at St. Vincent's Orthopaedic Hospital great help to be obtained from the employment of intelligence tests and the fixing of the intelligence quotient of each patient. As he truly says, there is no relationship between the type and degree of physical disability and the amount of psychical failure. "The tragedy is," he says, "that a general impression exists that the mental defect is severe in all cases," and he points out that many of these children are capable of improvement. For the best results an 'obstinate sort of optimism' is necessary. To give up trying, to isolate the cases, and to keep them away from suitable schooling is altogether wrong. The symptoms of worst import are fits, gross mental deficiency, incontinence, and blindness; but in the absence of these all these cases "should be regarded as interesting soluble problems in education, rather than a dull pitiful group of dependent cripples." Orthopaedic treatment may be of great value in preventing deformities, and the best results will be obtained by the co-operation of the neurologist with the orthopaedic surgeon.

REFERENCES.—¹*Proc. Roy. Soc. Med. (Sect. Orthop.)*, 1932, xxv, 578; ²*Arch. Neurol. and Psychiat.*, 1931, xxv, 453.

CEREBRAL TUMOUR, PAPILLOEDEMA IN.

Macdonald Critchley, M.D., F.R.C.P.

The occurrence of unequal degrees of papilloedema in the two optic discs is a commonplace in cases of cerebral tumour; moreover, it is well known that signs of early papilloedema may occur in one eye only and may remain unilateral for some time. Whether the observed facts can be utilized for the purpose of localizing or lateralizing the neoplasm has for long been under dispute. It is well known that papilloedema may be found in one optic disc, together with a pressure atrophy in the other disc; in such cases, the neoplasm is situated on the side opposite to that of the papilloedema. The other type of case presents greater difficulty, however. It was the practice of Horsley to look for differences in the two discs between the amount of swelling, and to associate the side of the tumour with the side of the greater oedema. The experiences of J. P. M. Martin¹ were confirmatory, in that out of 55 cases of cerebral tumour with unequal choked discs, in 71 per cent the greater choking was on the side of the tumour. M. Gunn's² experiences were confirmatory in so far as frontal and temporo-sphenoidal growths were concerned. L. Paton,³ however, brought forward details of 17 cases in which papilloedema developed first in one eye whilst the patient was under observation; in 11 it developed first in the opposite eye, and in 6 in the eye on the same side. Of 48 cases in which the degree of papilloedema was unequal, in 25 the swelling was greater in the eye on the side of the tumour, and in 23 it was greater in the opposite eye. A recent study by F. A. Gibbs⁴ has been based upon analysis of 380 cases of

cerebral tumour with unequal choked disc. His conclusions are that greater choking tends to occur on the same side as the tumour; this statement holds true especially for temporal and parietal growths, whereas in the case of occipital tumour the reverse is usually the case. Gibbs' figures support the views of G. W. Swift,⁴ who attributes unequal degrees of papilloedema to an unequal interference with venous drainage from the two nerve-heads.

REFERENCES.—¹*Lancet*, 1897, II, 81; ²*Brain*, 1898, XI, 332; ³*Ibid.* 1909, XXXII, 65; ⁴*Arch. of Neurol. and Psychiat.* 1932, XXVII, 828, ⁵*Northwest Med.* 1927, XLVI, 579; *Arch. of Ophthalmol.* 1930, III, 47.

CEREBROSPINAL FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—A. W. Hedrich¹ gives an historical sketch of the disease since its first recognition by Vieussieux, of Geneva, in 1805, and surveys its incidence in the United States and other countries during the period 1915-30. He shows that though meningococcus infection is extremely widespread, especially in epidemic times, when it may reach 70 per cent. the clinical disease is rare, barely 11,000 cases having been reported in the United States during 1929. The disease, however, is very fatal, as 5208 cases or nearly half this number died. The case mortality in certain large cities was as follows: New York 49 per cent, Detroit 50 per cent, Chicago 53 per cent, and San Francisco 76 per cent. In the recent epidemic all sections of the United States were not attacked simultaneously, but the disease first appeared in 1925 in the Far West, and in one to three years later invaded the remaining sections. Cerebrospinal fever became epidemic in Europe shortly after the outbreak of the Great War, the crest of the wave being in 1915 in England, Germany, and France, and in 1916 in Denmark. In England and Wales there was a second rise in 1917, followed by a gradual decline until 1923, when a fresh rise began which lasted until 1930. In the rest of Europe the outbreak did not synchronize perfectly with that in England and North America. In Germany, for instance, there was a well-marked epidemic in 1922, and minor outbreaks took place in other countries in that year or the next. There were subsequent epidemics in France and Denmark in 1925 and in Sweden in 1926, when the incidence of the disease in the United States and England was approaching the minimum. In many parts of the rest of the world there was a co-ordination with the movement of the disease in Europe and North America.

SYMPTOMS AND COMPLICATIONS.—Under the title of *epidemic meningitis minor* J. V. C. Braithwaite and W. Mitchell Innes² record 13 cases with symptoms of meningitis admitted to the Leicester Royal Infirmary in the course of six and a half weeks in the early spring of 1931. All the patients were young children; 10 were boys. The cerebrospinal fluid was under pressure, clear, and sterile. The protein was increased slightly, but usually there was no other abnormality. Lumbar or cisternal puncture caused rapid and complete disappearance of the symptoms. The writers suggest that the condition was an abortive form of cerebrospinal fever or influenzal meningitis.

C. Charleux³ reports a case of cerebrospinal fever complicated by *paralysis of the spinal accessory nerve*. The patient was a boy, aged 6 years, who on the sixth day of disease developed paralysis of the palate, difficulty in swallowing and hoarseness of voice, and falling of the head to the right side. Paresis of the left vocal cord was found on laryngoscopic examination. No other paralysis ensued, and the knee- and ankle-jerks were normal. The meningitis gradually cleared up, but the spinal accessory paralysis persisted, as was shown by partial reaction of degeneration, and atrophy of the left sternomastoid, although the palatal and laryngeal involvement subsided.

N. B. Gwyn⁴ records a case of *subacute meningococcal endocarditis*. The

patient was a woman, aged 37, who for eight months had shown the symptoms and physical signs characteristic of subacute bacterial endocarditis due to infection of the heart valves with *Streptococcus viridans*. Blood-cultures, however, in the last two weeks of her illness showed meningococci, and death was due to cerebrospinal meningitis. The autopsy findings agreed with those described in subacute bacterial endocarditis. Meningococci were recovered from the meninges only.

DIAGNOSIS.—The possibility of worms giving rise to symptoms simulating meningococcus meningitis is illustrated by L. J. M. Laurent,⁵ who records a case in a girl, aged 3½ years, who was admitted to the reviewer's hospital certified to be suffering from cerebrospinal meningitis, the symptoms being vomiting, convulsions, photophobia, nuchal rigidity, and general irritability passing on to drowsiness; 40 c.c. of clear colourless fluid were withdrawn by lumbar puncture under considerable pressure. Cultures remained sterile. The next day the child passed a large number of thread-worms after an enema, and during the next three days passed more worms as the result of anthelmintic treatment. By the third day her condition had become quite normal again. The case therefore was one of meningism due to *Oxyuris vermicularis*.

TREATMENT.—G. M. Lyon⁶ reports six cases of meningococcus meningitis in children aged from 9 months to 3½ years who were treated by large doses of **Anti-meningococcus Serum** (60, 70, or 80 c.c. at once) injected into the ventricle and simultaneous withdrawal of cerebrospinal fluid from the sub-arachnoid space. No bad effects were observed as the result of the large doses, but the cerebrospinal fluid became sterile within thirty-six to forty-eight hours, and clinical improvement was remarkably rapid.

J. N. C. Ford, G. Shera, and Sir J. Purves-Stewart⁷ report a case of fulminating meningococcal meningitis in a woman, aged 22, who recovered after systematic **Cisternal Punctures** and administration of **Polyvalent Serum** given intracisternally and intravenously under light anaesthesia. The writers recommend that in cisternal injections the serum should be carefully warmed and injected very slowly to avoid interfering with the respiratory centre.

REFERENCES.—¹*Public Health Rep.* 1931, 2709; ²*Brit. Med. Jour.* 1931, ii, 567; ³*Bull. Soc. de Péd. de Paris*, 1931, 608; ⁴*Arch. Internal Med.* 1931, xliiii, 1110; ⁵*Brit. Jour. Child. Dis.* 1931, 296; ⁶*Amer. Jour. Dis. Child.* 1931, xliii, 673; ⁷*Brit. Med. Jour.* 1932, i, 558.

CHANCROID.

Col. L. W. Harrison, D.S.O.

P. Ravaut, E. Rivalier and R. Cachera,¹ after mentioning the difficulty in certain cases of distinguishing between bubo due to Ducrey's bacillus and others such as lymphogranuloma inguinale, report the results of complement-fixation tests with an antigen derived from Ducrey's bacillus. In general they found the test highly specific, Ducrey infections giving a positive reaction almost always and lymphadenoma inguinale hardly ever. A strong difference between the two infections was manifest also, after injections of the Ducrey vaccine sold as 'Dmelcos.' In cases with Ducrey infection the vaccine produced a great increase in the titre of the reaction which might persist for many months, while in lymphadenoma inguinale and other control cases the titre was only moderately raised and lasted only a comparatively few weeks. The cutaneous test (see MEDICAL ANNUAL, 1931, p. 92, and 1932, p. 92) in cases of Ducrey infection became positive before the complement fixation, and the authors appear to think it of more value because, by the use of Frei's and Ducrey's antigens respectively in different sites, the cases of lymphadenoma inguinale can be positively distinguished from those of Ducrey infection, each reacting cutaneously only to its own antigen. F. Bernstein² recommends for the treatment of chancroid the local application of crystals of **Zinc Chloride**.

[This is only another addition to an already very long list of methods of local treatment. Most of them are unsatisfactory if used alone, but almost any of them—the simpler the better—serves if the patient is injected intravenously with *Dmolecos*.—L. W. H.]

Granuloma Inguinale.—F. G. Greenwood³ reports on the treatment of twenty-two cases of granuloma inguinale by **Diathermic Fulguration**. [The term 'granuloma venereum' or 'granuloma inguinale' is apt to be confused with 'lymphogranuloma inguinale' referred to above. It has no connection with lymphadenoma inguinale, and a number of workers have expressed regret that the term 'lymphogranuloma inguinale' was ever invented. Clinically granuloma inguinale is a nodular and ulcerative affection of the pudenda, probably identical, as the author says, with the disease described formerly by Macleod as 'serpiginous ulceration of the genitals'. In this country it is apt to be confused with chancroid, as it is seen only rarely in the ordinary practice of V.D. clinics. It may be suspected when a centrifugally spreading intractable ulceration which leaves behind it a weak scar is found on the genitals of a man who has recently lived in the tropics. **Antimony** appears to be a specific for the condition; it is usually given intravenously in the form of a 5 per cent solution of tartar emetic, the dose ranging from $\frac{1}{2}$ to $1\frac{1}{2}$ gr. every two or three days. Various other preparations of antimony are also employed such as stibeny, Heyden's No. 661, stibosan, and sodium antimony thioglycollate. Antimony appears, however, to be somewhat slow and uncertain in its effect, so that there is room for a successful adjuvant treatment such as that suggested by the author.—L. W. H.] The fulguration was applied under general anaesthesia to the active edge of the lesion. It should clearly be entrusted to an expert in diathermy, so that it is unnecessary to detail the author's technique. The results appear to have been very satisfactory. The average time taken for healing was seventy days, which the author says is much shorter than under any method so far practised. The number of treatments need not exceed two, and the second, when necessary, can probably be done under local anaesthesia.

REFERENCES.—¹*Presse m'd.* 1932, March 16, 409. ²*Arch. f. Dermatol.* 1931, CLIII, 506 (Ref. *Zentralb. f. Bakteriol.* 1931, CIV, 8). ³*Brit. Jour. Radiol.* 1931, Oct., 488.

CHEMOTHERAPY OF CANCER, (See CANCER, CHEMOTHERAPY OF.)

CHICKEN-POX. (See also HERPES ZOSTER.)

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—De Decker¹ describes an epidemic of varicella which occurred at Kipushi in the Belgian Congo, where the disease is endemic, in the second half of 1931. During the first seven months of the year the average number of cases monthly was 6, but in August the number rose to 28, and in September to 144. In October it was 131 and in November fell to 42, while in December it reached the average level again. Of 398 cases admitted to hospital, 334 were workmen, 34 women, 27 children, and 3 strangers to the district. No deaths occurred, but the epidemic was serious in that it involved 4453 days' stay in hospital for the workmen. Miners were much more frequently attacked than workers above ground, in the proportion of 7 to 3. The other remarkable features of the epidemic were the relatively small incidence of the disease among women and children and the fact that adults were mainly affected, whereas in Europe varicella is essentially a disease of childhood. In two-thirds of the cases the disease ran a typical course, but in the remainder it closely resembled varioloid or mild small-pox in vaccinated persons. No benefit was derived from treatment by convalescent serum.

SYMPTOMS AND COMPLICATIONS.—Owing to the rarity of severe attacks of varicella the case recorded by A. V. Salomon¹ is of interest. The patient was a girl, aged 5 years, who had been exposed to scarlet fever. The attack was accompanied by an acute streptococcus pharyngitis and tonsillitis which were complicated by a bilateral mastoiditis, bacteriæmia with numerous metastatic pus foci, and left sinus thrombosis, which ended in complete recovery after four major operations, numerous minor incisions of metastatic furuncles, and two blood transfusions. It is a question whether the patient had contracted an attack of non-eruptive scarlet fever which was checked by rapid and intensive use of scarlatinal antitoxin or whether the condition was due to secondary infection.

A. Netter² deals as follows with the objections raised by Comby to a close relationship between herpes zoster and varicella: (1) According to Comby varicella is a very common and exceedingly contagious disease, whereas zoster is very rare at the time of predilection for varicella, and is not contagious. Netter, however, alludes to several cases on record showing that though less contagious than varicella zoster may be transmitted by contagion. (2) Comby maintains that varicella is inoculable, while zoster is not. Netter, however, refers to several cases recently published by Austrian, German, Italian, and Rumanian authorities of successful inoculation of zoster. (3) Comby considers that the absence of reciprocal immunity is shown by the concurrence of varicella and thoracic zoster, whereas Netter regards this concurrence as an argument in favour of a common cause for both diseases.

DIAGNOSIS.—S. A. Glaubersohn⁴ gives the name of the *Skłowsky symptom*, which he regards as pathognomonic of varicella, to the following phenomenon described by Professor E. L. Skłowsky in 1927. When light pressure with the index finger is made upon the healthy skin near and then over the vesicle, the wall of the vesicle rapidly collapses and the contents escape. While this symptom is found both in the large and small vesicles of chicken-pox, it does not take place in a number of vesicular skin diseases such as strophulus, vesicular urticaria, eczema in the vesicular stage, herpes zoster, herpes simplex, and dermatitis herpetiformis.

PROPHYLAXIS.—During an epidemic of varicella in a children's home at Stockholm, C. Gyllensward⁵ on three different occasions inoculated 41 children with 0.1 c.c. of the clear contents of varicella vesicles taken from a child on the second day of disease: 15 were inoculated subcutaneously and 26 intracutaneously; 19 had undoubtedly already had chicken-pox, and 19 had not had it. All showed some redness and swelling at the inoculation site within twenty-four hours with the exception of one child who had had a previous attack of varicella. Three children who had not previously had varicella developed an abortive attack on the second, sixth, and fourteenth days after inoculation. There was no control group, but a child who had not been inoculated had a profuse eruption and moderately severe constitutional disturbance. After inoculation of all the children who had not had an attack the epidemic, which had lasted two-and-a-half months, came to an end.

REFERENCES.—¹*Bull. méd. du Katanga*, 1932, 10; ²*Arch. of Pediat.* 1931, 679; ³*Bull. Soc. méd. Hôp. de Paris*, 1932, 1194; ⁴*Urol. and Cutan. Rev.* 1931, 718; ⁵*Acta med. Scand.* 1931, 106.

CHILDREN, MEDICAL DISEASES OF. (See ANÆMIAS OF INFANCY; CEREBRAL DIPLEGIA; CONVULSIONS IN INFANCY; INTUSSUSCEPTION, RADIOGRAPHY IN; JAUNDICE IN CHILDHOOD; NEWBORN, BIRTH INJURIES IN; NEWBORN, HÆMORRHAGIC DISEASE OF; OTITIS MEDIA IN INFANCY; STEATORRHEA, IDIOPATHIC; TUBEROSE SCLEROSIS.)

CHILDREN, SURGICAL DISEASES OF. (*See* CLEFT PALATE AND HARE-LIP; EMPYEMA; HIRSCHSPRUNG'S DISEASE; INTUSSUSCEPTION; OSSIFICATION, DISEASES DUE TO ERRORS OF; PERITONITIS, PNEUMOCOCCAL; POLIOMYELITIS, ANTERIOR, SURGERY OF; PYLORUS, CONGENITAL STENOSIS OF; RECTUM, PROLAPSE OF; SPINA BIFIDA; SUBDURAL HÆMATOMA IN INFANTS; TESTIS, UNDESCENDED; UROLOGICAL SURGERY IN CHILDHOOD.)

CHOLECYSTITIS, CHRONIC.

Robert Hutchison, M.D., F.R.C.P.

DIAGNOSIS.—G. Levene¹ describes a new sign in cases of gall-bladder disease—*tenderness in the right costovertebral angle*. In order to elicit this sign the patient is placed prone on the examining table, the arms by the sides. The examiner stands at the side, and placing the middle finger and thumb, respectively, over the left and right costovertebral angles, applies gentle pressure, first over the left and then over the right side. He then explores the area from the tenth to the twelfth ribs, in a zone 1 or 2 in. from the spine. It is better to palpate the left side first, in order to determine the general reaction of the patient. The sign was positive in over 90 per cent of patients showing X-ray evidence of gall-bladder disease. Tenderness due to gall-bladder disease is found invariably higher than that produced by disease of the right kidney. However, its location may vary a distance of one or two ribs, depending on the position of the gall-bladder.

D. W. Carmalt-Jones² draws attention to another new sign—*tenderness over the lower edge of the eighth right costal cartilage*. The sign is sought for with the hand flat on the upper abdomen; the third finger-tip is brought into firm contact with the costal margin, inch by inch along its whole length from without inwards, beginning on the left side, saying nothing and watching the patient's face. Occasionally in cases of gastric ulcer there is a similar but slighter area of tenderness on the left rib margin, but it is inconstant. On the right, in a case of cholecystitis, a single tender spot, indicated by the patient's expression, is found, generally on the eighth rib edge, sometimes a little higher or lower, and just covered by the finger-tip. Occasionally but by no means always, the skin of the whole eighth dorsal segment on the same side is hyperalgesic to pin-prick. The author believes this tender spot to be quite as dependable in the diagnosis of cholecystitis as is McBurney's point in appendicitis.

Franklin W. White and I. R. Jankelson³ mention the occasional occurrence of severe *gastro-intestinal hæmorrhage* in cases of cholecystitis which may lead to an erroneous diagnosis of peptic ulcer. The cause of the hæmorrhage is obscure, but it may perhaps be due to infection of the gastric mucosa from the gall-bladder.

TREATMENT.—R. Finkelstein and E. W. Lipschutz⁴ report on the results of treatment by **Oleic Acid and Bile Salts** in 25 cases. The doses used were 2 c.c. of the acid and 1 gr. of the salts t.d.s. for periods of six to eight weeks. In over 70 per cent the symptoms disappeared or were greatly improved.

J. Tate Mason⁵ compares the late results of surgical and medical treatment in 200 cases, after a lapse of five years. Only one-third of the cases treated medically became symptom-free, whilst 83 per cent of those treated surgically considered themselves cured. The medical treatment employed consisted almost entirely of dieting and regulation of the bowels, but bile salts were usually given. Patients sensitive to particular articles of food were found to be less apt to respond to medical treatment.

REFERENCES.—¹*New Eng. Jour. Med.* 1931, Aug. 20, 403; ²*Lancet*, 1932, i, 615; ³*New Eng. Jour. Med.* 1931, Oct. 22, 793; ⁴*Med. Jour. and Record*, 1932, May 4, 440; ⁵*Ann. of Surg.* 1931, Oct., 786.

CHOLERA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Bacteriophages.—The interesting but complicated subject of the action of bacteriophages in destroying the cholera organisms continues to attract investigators in India, especially in the Calcutta School of Tropical Medicine. C. L. Pasricha and A. J. de Monte¹ report on the seasonal variations of cholera bacteriophages in 385 samples of river and tank waters in Calcutta, and they also examined the stools of 408 non-cholera cases for them, with 4 per cent positive. As usual, most of the cholera cases occurred in the hot months of March to June and the fewest in the rainy season July to September, and the percentage of cases from which the bacteriophage was isolated followed a similar curve. The case-mortality is always highest in January and February, and the writers point out that it declines in the hot weather when the bacteriophages increase. [On the other hand, it is lowest in the rains, when bacteriophages are rarely found, so there is no definite relationship between the presence of the bacteriophages and the case-mortality, although the writers attribute the lower mortality to bacteriophages.] The bacteriophage was isolated from 57 of the 385 samples of water, or 14.7 per cent, nearly all of the A type acting only on smooth-type cholera vibrios. Non-agglutinating vibrios were isolated from 59 per cent of 386 samples of water, and their presence followed very closely the seasonal incidence of cholera cases, but they are not more frequent at the beginning of the cholera season.

In a further paper the same workers with S. K. Gupta² record a preliminary note on one new type—cholera bacteriophage D—and two possible further ones, E and F. Type D possesses reciprocal action similar to that of the Asheshov types A, B, and C.

The same three workers³ also deal with the mutation of cholera-like vibrios under the action of bacteriophages. In 355 cholera-like vibrios isolated from Calcutta waters none were dissolved by the A type of bacteriophage found in a few of the waters, and only 20 per cent were lysed by types B and C bacteriophages. Secondary bacteriophage-resistant colonies obtained after bacteriophage action on cholera-like vibrios may absorb agglutinins and produce strongly agglutinating serums, but these characters are difficult to maintain in subcultures, and the change is due to the mere presence of the bacteriophage. Loss of agglutinability may result naturally in the body. The authors believe that many of the morphologically similar vibrios isolated in nature where cholera exists differ only in serological reactions, and that they play a great part in the etiology of the disease. In yet another paper these writers⁴ deal further with technical points concerning the mutations of cholera vibrios.

C. G. Pandit and R. S. Rao⁵ in a small cholera outbreak in Madras isolated an A type of bacteriophage which showed lysis of each of the four groups of the A type hitherto isolated, although usually this is not the case.

The results of his forecast of cholera, small-pox, and plague incidence in India in 1931, and a fresh forecast for 1932, are recorded by L. Rogers,⁶ the former having proved to be correct in at least twelve out of the fifteen areas dealt with in the case of cholera. A healthy year as regards these epidemic diseases is forecasted for 1932. [This has proved correct up to the time of writing.]

Inoculation against Cholera.—G. C. Maître and M. L. Ahuja⁷ have investigated the causes of unpleasant reactions after cholera inoculations, and they consider them to be due to an excess of foreign proteins, the products of bacterial metabolism, such as peptones, proteoses, amino-acids, etc. They therefore advise the use of bacterial deposit with a minimum of nutrient material. The same workers⁸ report that cholera vaccines may be stored at a temperature

not exceeding 37° C. for a year without affecting their agglutinating power, but they do not advise their being kept over six months.

REFERENCES.—¹*Ind. Med. Gaz.* 1931, Oct., 543; ²*Ibid.* 1932, May, 262; ³*Ibid.* 1931, Nov., 610; ⁴*Ibid.* 1932, Feb., 64; ⁵*Ind. Jour. Med. Research*, 1932, April, 1019 and 1023; ⁶*Ind. Med. Gaz.* 1932, Feb., 61; ⁷*Ind. Jour. Med. Research*, 1931, July, 159; ⁸*Ibid.* 1932, Jan., 957.

CIRCUMCISION. (See PENIS, SURGERY OF.)

CLEFT PALATE AND HARE-LIP. *John Fraser, Ch.M., F.R.C.S.Ed.*

The errors of hare-lip and cleft palate have been fully reviewed in recent numbers of the MEDICAL ANNUAL, and at this time reference will be made only to one or two of the more important contributions.

Cleft Palate.—F. Risdon¹ gives a general review of the position, but perhaps the most remarkable statement in his paper is his claim of 100 per cent primary unions in relation to cleft palate, with the qualification that cases in which there is a small hole at the junction of hard and soft palates are excluded. He does not indicate what percentage of cases comes under this heading, but it is obvious that such results should not be included under the heading of primary union.

The type of operation varies in different cases, but it is evident that Risdon is attracted by a variety of Lane's operation described by Logan, and the posterior displacement operation described in the MEDICAL ANNUAL of 1929 (p. 217) under the name of Limberg's operation, but here associated with Dorrance's name.

A review of cleft palate surgery by A. D. Davis² opens with the interesting statement: "Statistics tell us that about 80 per cent of all palate plastic surgery result in failure in some form." It is difficult to reconcile this remark with that of Risdon previously quoted, and it makes one realize how misleading statistical information is apt to be. Briefly, however, Davis's paper is concerned with the old question—Should an osteoplastic operation form a part of the cleft palate repair? Davis is an enthusiastic advocate of this technique, and he claims that by such means one obtains a secure bony framework, a lowering of the palate arch, and a solution of the problem of orthodontia. His methods are, in fact, those of the Brophy operation, and he concludes with the remark that surgeons of experience are increasingly in favour of the bone-closure procedure. The pros and cons of the argument have been reviewed in these pages upon several occasions, and they need not be repeated now, but Davis's article is important in so far as it shows that there is evidently an increasing school in favour of the bone-closure procedure. It only remains to be said that British and Continental surgeons continue to be sceptical of the value of the manœuvre.

G. M. Dorrance's³ article, to which reference has already been made, is concerned partly with the anatomy of cleft palate and partly with a description of what he calls 'the push-back operation'. This operation is somewhat on the lines described by Limberg in 1929, and the details are shown in the accompanying illustration (*Plate VII*). In brief it implies separation of the mucoperiosteum from the hard palate, detachment of the muscles which pass from the posterior part of the hard palate into the velum, and a backward displacement of the separated structures, a manœuvre which permits closure of the cleft while retaining a sufficiency of length of the velum. The 'push-back' operation is probably the most satisfactory procedure for cleft-palate closure, because it affords sufficient relaxation while ensuring such a length of soft palate as permits efficient action of the sphincteric arrangements.

The details of pre-operative and post-operative treatment of hare-lip and cleft-palate cases is ably summarized by E. A. Kitlowski.⁴ The details recommended are on the usual lines, but it is interesting to notice that **Violet-ray Lamp** exposures are employed as the routine pre-operative procedure, beginning with one minute, the patient being 30 in. from the light, and the time being increased by one minute daily until a daily exposure of five minutes is reached. Five drops of 20 per cent **Argyrol** are instilled into each nostril daily for several days before and after the operation.

The results of 150 cleft-palate operations are very fairly reviewed by E. Pagnamenta.⁵ In general the operation was on the Langenbeck plan, and a time towards the end of the second year was that usually chosen for the operation. As far as healing was concerned the results were distinctly good, some 75 per cent healing by primary union, but the author alludes to the difficulty of securing satisfactory phonation even when the closure result appears satisfactory. He insists very rightly on the importance of special training in speech production if the best results are to be secured.

Hare-lip.—The treatment of hare-lip is discussed by W. Rosenthal.⁶ The article calls for no special comment beyond noting the recommendation to close the cleft in three layers—skin, muscular tissue, and mucous membrane being united independently. This is a procedure of very doubtful merit, for the introduction of so much suturing material is apt to imperil the line of healing, while no real functional or æsthetic improvement is gained. The method of two or three supporting sutures which include all the coats except the mucous membrane, and thereafter independent suture of skin and mucous membrane edges, gives better results.

REFERENCES.—¹*Canad. Med. Assoc. Jour.* 1931, Nov., 563; ²*Calif. and Western Med.* 1931, Nov., 357; ³*Ann. of Surg.* 1932, xcv, 641; ⁴*Ibid.* 659; ⁵*Deut. Zeits. f. Chir.* 1932, Juhl., 214; ⁶*Forts. d. Zahnk.* 1932, vi, 953.

COELIAC DISEASE. (See STEATORRŒHA, IDIOPATHIC.)

COLD, THE COMMON.

J. D. Rolleston, M.D., F.R.C.P.

PROPHYLAXIS.—Although a considerable amount of work has been and is still being done in connection with the prevention of the common cold, which forms a large proportion of all industrial lost time for sickness, no specific has yet been discovered.

R. V. Ward¹ records his three years' experience of **Vaccination** against the common cold among the employees in a large Montreal factory. The composition of the stock vaccine was as follows: *B. influenzae* 200 millions, streptococcus 100 millions, *Micrococcus catarrhalis* 200 millions, *Staphylococcus aureus* 200 millions, *Sta. albus* 200 millions per c.c. The dosage was 3 min. on the first day, followed by 5 min. three days later, and by 7 min. five days after that. Comparison of 426 vaccinated persons with an unvaccinated group of 1341 showed that considerable improvement took place in the records of the vaccinated as regards freedom from pneumonia, bronchitis, common colds, and tonsillitis; no serious reactions occurred. Ward concludes that although stock vaccines cannot be regarded as a sure and specific preventive of acute respiratory disease, they do benefit in a considerable number of cases.

H. P. Wright, J. B. Frosst, F. Fuchel, and M. L. Lawrence² point out that although a deficiency disease implies lowered resistance, infections being particularly liable to occur in rickets and scurvy, an over-supply of vitamins A, C, and D does not protect against rhinopharyngitis, as is shown by its high incidence among Canadians on their return to towns after a holiday where they have been liberally supplied with fresh fruit and vegetables. The writers

also gave a large amount of vitamin A to 20 infants, and 40 infants under precisely similar circumstances were supplied with the amount of vitamin A usually given to normal children. No appreciable difference, however, was found in the incidence of upper respiratory infections in the two groups.

REFERENCES.—¹*Canad. Med. Assoc. Jour.* 1931, xxv, 408; ²*Ibid.* 412.

COLITIS, ULCERATIVE.

Robert Hutchison, M.D., F.R.C.P.

BACTERIOLOGY.—J. A. Bargaen, with M. C. Copeland and L. A. Buie,¹ has studied the bacteriology of 56 cases, cultures being obtained by curetting the bases of ulcers after proper preparation of the colon. In no case could any dysentery organism be isolated, and agglutination tests were all negative. On the other hand, Bargaen's diplostreptococcus was isolated in 80 per cent of the cases. H. A. Rafsky and P. J. Manheim,² on the other hand, regard Bargaen's diplococcus as a strain of the enterococcus and in no way specific for the disease. They did not find it in even a majority of their cases. In this they agree with most English observers.

E. D. Kiefer³ in 25 cases found the Craig complement-fixation test for *Entamoeba histolytica* positive in 15 out of 19 cases and suggests that the disease may be due to a pyogenic infection superimposed upon an original amœbic ulceration. He thinks that all patients with ulcerative colitis should therefore have a course of **Emetine** treatment. If operation is required he prefers **Ileostomy**, and considers it a life-saving measure in severe cases.

J. R. B. Hern⁴ has studied all the cases of this disease (about 50) admitted to Guy's Hospital in ten years. His paper is one of the fullest that have recently appeared on the subject, but only some of his conclusions can be mentioned here. He defines the disease as "a diffuse regional or general inflammation of the colon, especially in its lower part, liable to ulceration, anatomically identical with chronic bacillary dysentery, of uncertain etiology, and possessing no apparent infectious properties". The most striking feature in the morbid anatomy is the deep and diffuse involvement of the submucosa in addition to part of the mucous membrane. The author thinks it most probable that the infection, whatever it may be, is blood-borne and does not attack the bowel from the surface. He devotes a good deal of space to a consideration of the radiography of the disease. In all cases one finds: (1) A rapid flow from the anus to the cæcum and equally rapid emptying; (2) A lumen which is at first narrow, whether it afterwards prove normal or reduced; (3) A smaller capacity than usual, often due chiefly to reduction of the rectal ampulla; (4) Reflux through the ileocecal valve more often than is normal. Loss of haustration in the upper colon is common. The fine military ulcers are not shown by X rays but only those of coarser grade.

PROGNOSIS.—As regards prognosis, the average duration exceeds six years and is more nearly ten or fifteen. The general hospital mortality is 28 per cent, increased to 40 per cent if cases are followed up. Relapses are very common. Differences of severity are due more to differences in extent than in intensity of the disease-process, and a high pulse-rate is of much graver import than a high temperature.

There is at the present time, however, no necessity for prognosis to be founded solely or even chiefly upon these vague generalities. The X rays provide a far sounder basis for it, as follows: (1) If gross ulceration is demonstrated in the upper parts of the colon the patient is likely to die, but will not necessarily do so. (2) If the upper colon is normal, death in the existing attack may be almost certainly excluded, though complete recovery may be very delayed. (3) If the small completely tubular colon is seen, and diarrhœa the chief symptom, no measurable improvement is to be looked for. (4) If

the completely tubular colon is seen and blood is being passed in considerable quantity, some improvement is very probable short of complete recovery. (5) So long as the ascending colon remains hausted, complete recovery remains possible, if not probable, whatever the condition be lower down.

TREATMENT.—According to Hern, treatment resolves itself into **General Nursing and Management**. Rest in bed, plenty of air and light, a liberal diet free from coarse residue, paraffin when required to prevent the formation of hard scybala, avoidance of all purgatives, possibly charcoal if the stools are very offensive, are about all that are worth while. Patience is abundantly necessary, and the employment of many harmless remedies is justified to preserve the patient's morale in face of what may prove one of the most desperately wearisome ordeals.

"The utility of lavage is problematical", but "**Transfusion** is rational and often appears highly beneficial". As to the use of anti-dysenteric serum, "it would be a gross exaggeration to claim that its effects are either dramatic or reliable or permanently curative". As regards the question of operation, the author shares the prejudice of the Guy's School against it and pooh-poohs the results claimed for it by Mummery.

REFERENCES. ¹*Practitioner*, 1931, Aug., 235; ²*Amer. Jour. Med. Sci.*, 1932, Feb., 262; ³*New Eng. Jour. Med.*, 1932, March 17, 552; *Amer. Jour. Med. Sci.*, 1932, May, 624; ⁴*Guy's Hosp. Rep.*, 1931, July, 322.

COLON, FUNCTIONAL DISORDERS OF.

Robert Hutchison, M.D., F.R.C.P.

E. I. Spriggs¹ has made a careful analysis of 242 cases of functional disorder of the colon, including in this term colonic delay or constipation, irritable colon with nervous diarrhoea, colospasm, and mucous and muco-membranous colitis.

ETIOLOGY.—An unstable nervous system, acquired or inherited, is a pre-disposing condition. Abuse of aperients is as potent a cause as constipation. Displacements of the colon are of no importance so long as the musculature is efficient. Study of the bacteriology of the bowel is not worth while.

DIAGNOSIS.—This rests upon thorough physical examination, personal inspection of the motions, the use of the sigmoidoscope, and X-ray examination after a barium enema.

PROGNOSIS.—In nearly all cases the patient recovers if the constipation can be cured without the use of chemical irritants.

TREATMENT.—The main rules are to allay anxiety, to abolish laxatives and purgatives, to give a suitable diet, and to regulate rest and exercise. In severe cases it may be necessary to remove the patient for a long time from the surroundings in which the trouble arose.

A mixed **Diet** is given, but meat is allowed only two or three times a week or at most once a day; eggs, fish, and cream cheese taking its place. Wholemeal bread is given with plenty of butter. Fresh fruit, salads, and cooked vegetables are allowed freely. **Acid Milk** prepared from a pure culture of *B. acidophilus* is of value.

Paraffin is the best laxative. If it 'runs away', it may be given in warm milk or immediately after food or as a jelly. **Belladonna** (7½ to 15 min. of the tincture in divided doses daily) is of great use in cases of spasm.

Alkalis may be given with it in cases of acidity and **Bromides** for excessive neurosis.

Irrigation of the Bowel is of value in mucous colitis, but should not be used oftener than every other day; normal saline is as good as any of the fluids that have been advocated. In cases of nervous diarrhoea the use of

Kaolin, Calcium Lactate (10 gr. t.d.s.), the omission of fruit and green vegetables from the diet, and encouragement usually give good results. To prescribe opium before any engagement is unwise, as it may lead to a habit.

REFERENCE.—*Quart. Jour. Med.* 1931, July, 533.

COLON, SURGICAL DISEASES OF. (See also HIRSCHSPRUNG'S DISEASE.)

A. Rendle Short, M.D., F.R.C.S.

Cancer of the Colon.—

DIAGNOSIS.—"It should be emphatically stated and reiterated again and again that any change, however slight, in the normal bowel behaviour of any individual without any known cause, particularly in the cancer age, persisting for more than a few days after adequate treatment is started, should demand the most painstaking investigation." So writes E. L. Young¹ (Massachusetts). He points out that the first X-ray examination is negative in 10 per cent of the cases in which cancer is present, so a single examination should never be taken as final. He attaches a good deal of importance to occult blood in the stools. Sir Gordon C. Watson,² writing on the same subject, says that with growths of the proximal colon pain is rarely complained of, but a sense of discomfort, with borborygmi, and a feeling that wind is held up somewhere. An ordinary X-ray, without barium, may show gaseous distension of the colon as far as a certain point; if the rectum is inflated, there may be a shadow at the site of the growth where the distended coils meet. F. W. Rankin^{3,4} (Rochester, Minn.) says that cancer of the right colon may show itself in one of three ways: there may be dyspepsia, or nothing but anaemia and weakness, or a lump. It is well known that anaemia may be the most prominent symptom in cancer of the stomach, but not so well known that it is also met with in cancer of the right colon. He considers that the presence or absence of occult blood is of little value. Cancers of the left colon cause obstructive symptoms.

TREATMENT.—

Pre-operative Treatment.—At the Mayo Clinic (Rankin), the patient is given a **Diet** low in residue but high in food value, such as butter, eggs, rice, candy, and fruit juice, with plenty of fluids, and if anemic a **Blood Transfusion**. A **Vaccine** of streptococci and colon bacilli, prepared from fatal cases of peritonitis, is given intraperitoneally as a routine three days before operation. This has been used in 500 cases, and is believed to have greatly reduced the death-rate from peritonitis from 23 to 5 per cent. According to Young, however, these injections upset the patient a good deal, causing malaise and fever. He injects, instead, 100 c.c. of amniotic fluid three days and one day before operation.

Operation for Cancer.—Gordon Watson, in cases of cancer of the left colon, prefers a one-stage resection with proximal drainage made at the time; when the growth is in the sigmoid, he aids the operation by a rectal tube passed through the stretched sphincter. If necessary, the patient is left with a colostomy, and the whole pelvic colon resected, but not the rectum.

Rankin says he has passed through various phases in relation to resection of the right colon; at present, if the patient is a good surgical risk, he prefers a one-stage hemicolectomy; in less fit patients a two-stage operation, commencing with an ileo-colostomy, followed by a resection. If obstruction follows at the site of the anastomosis a Witzel ileostomy may be done. For cancer of the sigmoid, if there is little or no obstruction, he advises a modified Mikulicz operation; the growth is resected with the glands, etc., and the two loops are brought to the surface like a double-barrelled gun, but instead of tying in tubes, clamps are left on the ends. That on the proximal loop has to be released to let off gas in sixty or seventy hours, sometimes sooner; the clamp on the distal

loop is left till it falls off. If the mucosa is not everted or attached to the skin, and six or seven weeks are allowed to elapse, the colostomy will often close spontaneously after crushing the spur with an enterotome. Of course, this closed method must not be used if there was obstruction before operation. F. H. Lahey^{5, 6, 7} contributes three articles. Two of these describe a method of hemicolectomy on the Mikulicz plan for cancer of the right colon. The terminal ileum, cæcum, and hepatic flexure as far as the transverse colon near its middle are resected, and the end of the ileum laid parallel to the transverse colon and sewn alongside it, so that both ends come out through the abdominal wall. If there is obstruction, the ileum is left long and projecting and a tube tied in; if not, both ends are left closed with clamps for a few days. After a week, a crushing cramp is put on to divide the spur. A month or more must elapse before the opening is closed. It is admitted that the discharging liquid faeces make the skin very sore, but that does not seem to interfere with healing when the opening is closed. He prefers an operation on the Mikulicz plan for all parts of the colon except the transverse. Like Rankin, he comments on the type of patient with cancer of the cæcum whose main symptom is anaemia.

D. Cheever⁸ (Boston) believes that it is better in cases of cancer of the left colon treated by resection and anastomosis to make a formal colostomy just proximal to the union, so as to divert the whole stream of faeces, rather than a cæcostomy. It is more trouble to close, but in his opinion safer. F. Starr⁹ (Toronto) leaves a rubber drainage tube in the lumen of an ileocolostomy to keep it open.

Statistics.—Sir C. Gordon-Watson gives the following table to illustrate his results:—

1921-1925			1927-1931			TOTAL		
Cases	Died	Percentage Mortality	Cases	Operation Mortality	Percentage Mortality	Cases	Operation Mortality	Percentage Mortality
41	9	21.9	34	7	20.5	75	16	21.0
Obstructed—								
11*	4†	36.3	5	3‡	60.0	16	7	43.7
Resected—								
22	5§	22.7	23	3||	13.0	46	8	17.7
Anastomosis only—								
6	0	Nil	3	1	33.3	9	1	11.0
Colostomy only (non-obstructed)—								
2	0	Nil	3	0	Nil	5	0	Nil

* Three cases resected later and included in resections; remainder, colon drainage or abdominal drainage.

† Two perforated at time of operation.

‡ One patient died under anaesthetic before operation.

§ Two shock; 2 peritonitis; 1 cardiac failure.

|| One peritonitis; 1 peritonitis and ileus; 1 pulmonary embolism.

In Rankin's table the statistics for 1920 from the Mayo Clinic are given. For growths of the right colon, there were 160 operations with 14 deaths (8.7 per cent). These include a small number of cases of tuberculosis of the cæcum and other conditions. For growths of the left colon, there were 227 operations with 17 deaths (7.4 per cent). Cheever reports 35 resections with preliminary cæcostomy or colostomy, with 8.5 per cent fatalities, and 50 cases without preliminary drainage, whereof 24 per cent died.

Hans Steindl¹⁰ (Vienna) has collected the figures there showing 76 cases of cancer of the sigmoid; 38 were resected, of which 9 died, while 31 were treated by colostomy, with 10 deaths. For all the colon growths in every situation, there were 82 resections with 26 deaths.

Cancer with Abscess.—J. Charricr and R. Leibovici¹¹ show that this condition is not necessarily inoperable; in fact, the abscess may lead to early diagnosis. They have treated 2 cases, and collect 17 from the literature. Of these, 70 per cent came through successfully, and at least 3 were well several years after. Usually the best treatment is to drain the abscess and perform cœcostomy as a first stage, and resect some weeks later; but sometimes the growth can be exteriorized at the first intervention, and resected within a few days.

Care of Colostomy.—W. M. Shedden¹² (Massachusetts) gives some hints on the management of a permanent colostomy. It is, or should be, well known that a colostomy need not unfit a patient for very active work or social life. As Shedden says, care of the diet, and lubricants by mouth, with or without a daily wash out, will usually ensure a morning evacuation and leave the patient free from inconvenience for the rest of the day. He does not like the usual rubber belt or bag. A better arrangement is a triple-layer dressing of absorbent cellulotton, then waterproof paper, then cellulotton, covered by a shallow aluminium plate about 6 in. across, shaped like an Army 'tin-hat'. This is held to the abdomen by two straps. If a deodorant is needed, the pad may be medicated, and the patient may take a daily capsule of kerol, 3 min. The metal plate cannot be used if the opening is too near the ribs or pelvic bones.

Hæmangioma of the Sigmoid.—This is a rare disease which has usually proved fatal, and the operative results unsatisfactory. A successful result has been obtained by a new method by F. W. Bancroft¹³ (New York). The characteristic symptom is persistent bleeding from the rectum over a number of years, often starting in childhood. Nothing can be felt per rectum, but the sigmoidoscope may show dilated vessels in the mucosa of the sigmoid. Bancroft's patient, a boy of 17, was cured by opening the abdomen, performing a temporary colostomy, tying the superior hæmorrhoidal vein, and injecting the vein with 10 c.c. of 40 per cent **Sodium Salicylate** (Plate VIII). Nearly a year later the colostomy was closed, and it was observed that the dilated vessels on the sigmoid were mostly thrombosed. The result was very satisfactory.

Granuloma of the Colon in Amœbic Dysentery.—H. Gunn and N. Howard¹⁴ (San Francisco) have had three cases in six months and report a number of others from the literature. The symptoms, physical signs, and X-ray appearances exactly resemble carcinoma, and the growths were removed. Amœbæ were found in the sections. Cases are on record in which patients have refused operation for supposed cancer of the colon, and the lump has disappeared after a course of anti-amœbic treatment.

Ulcerative Colitis.—J. R. Regan and E. H. Mensing¹⁵ (Milwaukee) describe three cases all very well upwards of seven years after operation for severe ulcerative colitis which proved refractory to medical treatment. An ileostomy was performed to give complete rest to the colon, and left open from one to three months; then the ileum was anastomosed to the colon and an appendicostomy performed.

Acute Dilatation of the Colon.—J. Schoemaker¹⁶ asserts that acute dilatation occurs not only in the stomach but in the colon. It comes on without apparent cause in middle-aged or elderly people. The symptoms are those of acute intestinal obstruction, and the patient is operated upon in expectation of finding a carcinoma. A Witzel fistula should be made. Of 7 cases, 6

survived. [Two cases have come under our own care. One lived, the other died.—A. R. S.]

Preservation of the Ileocaecal Sphincter.—W. H. Ogilvie,¹⁷ believing that the sphincter has considerable physiological importance, describes a method of performing hemicolectomy, i.e., resection of the caecum, ascending colon, hepatic flexure and part of the transverse colon, with retention of the sphincter. An end-to-end anastomosis is made, the ileum, with a small piece of caecum including the sphincter, being implanted in the transverse colon. Three cases are described suffering from dysfunction or adhesions of the caecum and ascending colon; all were benefited, but had only been followed a few months.

Total Colectomy.—By this term F. W. Rankin¹⁸ means excision not only of the whole caecum and colon, but of the rectum as well. The indications for such a drastic procedure are multiple adenomatosis (polyposis) which is a precursor of cancer, and certain intractable cases of ulcerative colitis. Six cases from the Mayo Clinic are reported, and all survived. A three-stage method was followed: first, ileostomy; next, colectomy down to the sigmoid; and lastly, abdomino-perineal excision of the rectum. Time must be allowed after the first stage for the ileum to acquire the power of absorbing water. This takes about three months. In cases of ulcerative colitis the sigmoid is too friable and rigid for the stump to be closed, and it is better to bring the end out through the abdominal wound. The third operation is the most difficult; it is performed like the classical abdomino-perineal excision of the rectum for cancer, except that the perineal stage is done first and the abdominal last. After the rectum has been freed from below as far as the peritoneal floor, it is enclosed in a rubber glove, and the wound closed. The rectum and the glove are then pulled up from the abdomen, dissected away, and the peritoneal floor reconstituted. The empty space is drained through the perineum, by removing some of the stitches.



Fig. 16. —Infantilism in a man of 22, due to intestinal polyposis. (By kind permission of 'La Presse médicale'.)

he maintains, is not to resort to multiple-stage operations, but to provide a safety-valve by introducing a tube in the bowel above the anastomosis by the Witzel technique. This reduces the mortality to 16 per cent, and the fistula closes of itself.

Intestinal Polyposis.—An interesting and well-illustrated article is contributed by R. Bensaude, P. Hillemand, and P. Augier.²⁰ They point out that

Colon Resection.—H. von Haberer¹⁹ writes on this subject, particularly with reference to acute or subacute ileus. He says that his mortality for 172 cases of colon resection is 25 per cent using the one-stage operation, and that cardiac failure as a result of ileus is the main cause of death. The remedy,

the condition may give rise to infantilism, and append a picture of a case (Fig. 16). The diagnosis can be made by the barium enema, and often by the sigmoidoscope (Plate 1X). It is possible to destroy any polypi within reach by diathermy (Fig. 17).

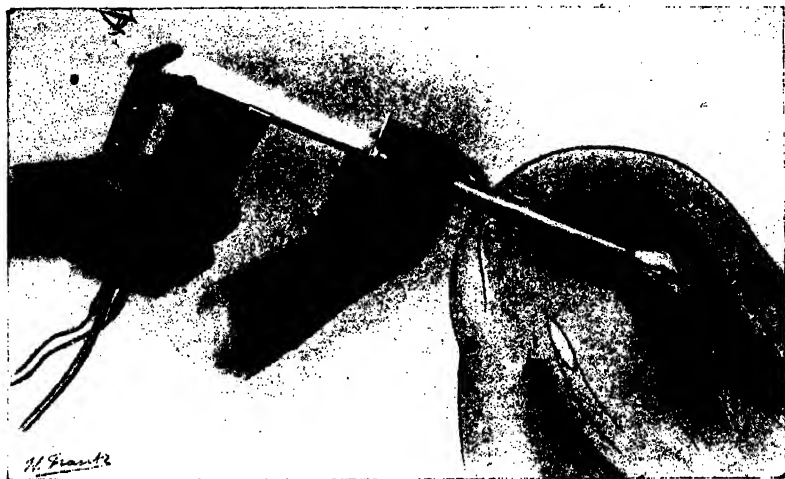


Fig. 17.—Marchand's diathermy forceps for electro-coagulation. (The source of illumination is an integral part of the instrument.) (By kind permission of 'La Presse médicale'.)

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CONVALESCENTS, TREATMENT OF. (See PHARMACOLOGY AND THERAPEUTICS.)

CONVULSIONS IN INFANCY.

Reginald Miller, M.D., F.R.C.P.

S. Graham¹ discusses the significance of convulsions in infants—that is, in children under the age of 2 years. He reviews the older hypotheses to account for the fact that convulsions occur more easily and frequently in infants than in adults. The oldest theory is that of Soltmann dating from the middle of last century. This viewed the infant's nervous system before the medullation of the nerve-fibres as lacking in the power of inhibition, and the peripheral nerves at the same age as unduly excitable. From this it was deduced that any sort of peripheral irritation, such as gastro-intestinal upsets, teething, worms, phimosis, and so on, would readily set up convulsions. In practice this hypothesis failed to satisfy, as there seemed no correlation between the degree of peripheral irritation and the tendency to convulsions. Such severe peripheral irritation, for instance, as a burn is not peculiarly liable to produce convulsions, nor are convulsions associated particularly with the severer forms of constipation. A more convincing hypothesis is to the effect that infants suffer more frequently than older children from convulsions because there

exists in them a state in which the calcium metabolism is more readily deranged, (the 'spasmophilic condition' of Heubner, or the 'spasmophilic diathesis' of Finkelstein). In them a lowering of the amount of ionic blood calcium is specially prone to occur from changes in the acid-base balance produced by any cause; and of these causes the most significant is fever. Calcium being the most sedative salt, its diminution tends towards convulsions.

This calcium instability is, as is well known, present in all infants suffering from frank rickets; but Graham lays special emphasis on the fact that it is not confined to such infants, and may occur in those who show no clinical or radiographic evidence of rickets. If the suggestion put forward is the true explanation of infantile convulsions, then the incidence of convulsions should show the same seasonal variations as does tetany, and this Graham finds to be the case. On these grounds it may therefore be taken that the commonest type of infantile convulsion is that associated with a low blood calcium. Such a view, it is to be noted, takes us a good deal further than the vaguer impressions widely held for many years, that convulsions are commoner in rachitic than in non-rachitic infants, and that they may be an actual nervous manifestation of rickets.

Putting the foregoing type of infantile convulsion first in importance and frequency, Graham proceeds to discuss other groups of the disorder. He gives the following: (1) Convulsions of the newborn, due to cerebral trauma, vascular lesions, or possibly, in view of the favourable end-result of some instances, cerebral oedema; (2) 'Idiopathic convulsions' in infants between 2 and 4 or 5 months of age, and controllable by the use of chloral; (3) Convulsions due to disease of the nervous system—meningitis, encephalitis, and mental deficiency will be the most obvious causes. To these groups some would add hypoglycæmic convulsions, but N. Morris,² who has been working in conjunction with S. Graham, doubts if this is a true factor in the production of convulsions.

TREATMENT.—This may be discussed under three headings:—

1. First, there is the immediate treatment to be adopted to cause cessation of the fits. Here there is the time-honoured expedient of the **Hot Bath** or hot mustard bath, which has, as has been said, the virtue of giving the mother and nurse something to do before the doctor arrives. **Chloroform Inhalation** may be tried, but the use of sedative drugs is better. For this purpose **Chloral** may be given by mouth, or, if this is impossible, by the bowel: 2 to 4 gr. should be given at once (or 5 gr. per rectum in water) and repeated every two hours, if necessary. Graham advises for a baby of one month old 1 gr. of chloral every two hours. [In an infant of 24 hours old, 1 gr. of **Bromide** every hour for four doses, and then four-hourly, is often quite efficacious.—R.M.] Whatever sedative is used, it is of the utmost importance that its administration should not be dropped suddenly. The doses should be gradually lessened and the intervals between them gradually lengthened.

2. Every effort must be made to exclude organic disease of the brain as the cause of the convulsions.

3. Bearing in mind what has been said above on the diminution in the blood calcium, treatment by means of **Calcium Chloride** and **Cod-liver Oil** should be instituted. It should be understood that the calcium salt used is not meant to be absorbed as such, and it is a mistake, therefore, to use calcium lactate. The chloride is used for its acid-producing qualities, not for its calcium. The lactate, being a neutral salt, is inefficient. The dose of the chloride recommended by Graham is from 15 to 30 gr. every four hours for three days only. The simultaneous administration of cod-liver oil (or such substitutes as **Radiostol** or **Ostelin**) ensures an increased absorption of calcium.

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CORNEA, DISEASES OF.*W. S. Duke-Elder, M.D., F.R.C.S.*

Corneal Ulcers.—The treatment of corneal ulcers complicated by a hypopyon by means of paracentesis with a fine-pointed **Galvanocautery** is suggested by G. Pacalin.¹ The cautery is plunged into the anterior chamber and quickly withdrawn, whereupon the aqueous humour escapes in a jet; if the puncture is made rapidly, the scar left behind is small. The selection of the area to puncture depends somewhat on the location of the ulcer. If the ulcer is peripherally situated, the puncture is made through it near its highest margin. If centrally located, the puncture may be made through clear cornea about half way between the limbus and the centre of the cornea. The advantages of the cautery over the knife are several: the operation is extremely simple of performance and does not require fixation of the eye (often a difficult matter); the cautery does not open up avenues of infection in the corneal tissues and is therefore sounder in principle than the knife, and the wound leaks for some time, prolonging the action of the paracentesis.

Marginal Degeneration of the Cornea.—L. Lugli,² in a report of three cases of this condition, concludes that marginal degeneration of the cornea is essentially due to endocrine disturbances, and that the inflammatory symptoms are not invariably present and are incidental and secondary. One case occurred in a boy of 18, another in a woman of 45, neither of whom showed general conditions that seemed to account for the condition. In both of these there developed over a period of years a typical bilateral furrow around the corneal periphery, the corneas being thin in this area, and containing fine vessels that terminated centrally in a grey line of opacity. Periods of slight irritation and congestion marked the early stages in both cases, but no loss of epithelium was ever observed. Astigmatism developed which varied from 1.75 to 5 dioptres. In one case vision was reduced to 6/10 in spite of correction in one eye, while in the other it could be corrected to about normal. The third patient, a woman of 43, showed, besides a furrow of the right cornea, a definite ectasia of the upper portion. The cornea was exceedingly thin at the summit of the ectasia and above it. A cystic cavity filled with clear fluid was present in the stroma. No signs of arcus senilis were present in either cornea. Vision in the right eye was reduced to 1/50 owing to corneal astigmatism of 20 dioptres. The left cornea showed a slight thinning of its upper part near the limbus, containing thin vessels but with no fatty deposits in the cornea.

All the cases showed endocrine disturbances: the first hypothyroidism, the second a premature menopause due to complete hysterectomy, and the third premature senility. The author concludes that the glandular imbalance is the only factor that could be considered a cause in all cases. The deposit of fat, considered by Schieck to be the primary change, was absent in the third case, while the relation to arcus senilis was absent in this case and in the first case.

Epithelial Dystrophy of the Cornea.—Fuchs originally described the condition of epithelial dystrophy of the cornea in 1910. In its essentials the condition consists in an œdema of the corneal epithelium with the formation of numerous blebs of varying size, associated with punctate greyish opacities in the epithelium and greyish lines and dots in the parenchyma. The condition begins insidiously, the only symptom being gradual diminution of vision, which is reduced to 6/60 or even counting fingers. The sensation of the cornea is greatly diminished or absent, and Fuchs believed the cause of the condition to be a disturbance of nutrition affecting the superficial corneal nerves. Treatment was of practically no effect in his cases, removal of the epithelium being followed by only temporary improvement. The cases collected from the literature since Fuchs' report bear out his description in almost all particulars.

The typical picture of epithelial dystrophy can be confused with but few conditions. In advanced or absolute glaucoma the cornea often shows changes that are identical, and it is quite possible that in some of the reported cases in which glaucoma occurred this was the primary condition, the corneal changes being secondary to increased tension. Changes in the cornea following cataract operation may produce exactly the same picture. The changes in neuroparalytic keratitis may also greatly resemble this condition, although they more often resemble the mild form to be described.

While the typical picture occurs but rarely, it would appear from the observations of S. R. Gifford³ (1932) that the disease occurs commonly in a mild form, of which he describes twenty-three cases. The usual history in the mild form is of a scratchy feeling in the eyes with some diminution in vision. There is seldom any real pain, and vision is apt to be worse in the morning, clearing up later, and often being practically normal for the greater part of the day. One eye is usually affected more than the other, and often a decrease in vision is noted only in one eye. This decrease is seldom extreme, vision varying from 20/30 to 20/50 in cases of average severity, and in milder cases vision is practically normal at most examinations. The age of the patients varies, but most are in middle life or older. On ordinary examination few objective signs are to be seen. There is often slight superficial congestion, but there may be none at all. Examination with focal illumination may show a slight dullness of the window reflex, which with the loupe may be resolved into a slight roughening of the corneal epithelium. Ophthalmoscopic examination with the dilated pupil and a plus 10 dioptré sphere before the ophthalmoscope will often show a number of fine black dots against the red reflex, which, when one is familiar with the condition, may at once lead to the diagnosis. In many mild cases, however, nothing is seen with the ophthalmoscope. A moderate degree of chronic catarrhal conjunctivitis and blepharitis is often present. Such patients, especially those in whom the visual defect is inconsiderable at the time of examination, may be considered as simply sufferers from eye-strain. They have often been refracted, frequently without obtaining benefit from the changes made in the correction, or have been given treatment for the lids.

Examination with the slit-lamp, after the instillation of 1 per cent fluorescein, shows changes that make a diagnosis unavoidable in even the mildest cases. A number of areas that stain with fluorescein are seen which vary in number from five or six to several hundred. Minute blebs may be present, but more often it is only the remains of ruptured blebs, the staining areas, which are seen. These areas are usually more numerous just below the centre, but may be found all over the cornea. Between such areas, and usually involving the whole corneal epithelium, tiny droplets are present, which are best seen with retro-illumination, the beam being focused on the iris while the cornea over this is examined with the microscope. The droplets are so small as to be distinct only with the higher magnifications of the microscope. They represent an œdema of the epithelium that is always present, the droplets collecting, apparently, between the epithelial cells. In certain places they form tiny blebs, which promptly rupture and leave staining areas from five to twenty times as large as the original droplets. They may be so large as to be seen with the loupe, but are never to be confused with the larger blebs occurring in recurrent erosion of the cornea; the pain associated with their formation in the latter condition is entirely absent. Besides œdema of the epithelium and staining areas, which are constant, many cases show fine punctate white dots in the epithelium which do not stain and which seem to represent the site of former blebs. The corneal nerves are often definitely

enlarged, but such nerves may show no particular relation to the opacities. Opacities in the corneal stroma are only occasionally seen in the more severe cases.

An almost constant finding in the mild form of epithelial dystrophy, as well as the typical form, is more or less marked insensitivity of the cornea. When tested with a tightly wound cotton wisp, cut off with scissors so that what remains is fairly stiff, most patients feel no sensation of pain and do not wink when touched—an interesting analogy between epithelial dystrophy and herpetic corneal lesions and neuroparalytic keratitis.

TREATMENT.—The treatment for the typical form of epithelial dystrophy is discouraging. Fuchs tried removing the corneal epithelium and applying **Iodine**, as has been done with success in recurrent erosion, but in the dystrophy cases the results were only temporary, and no other form of treatment seemed to have any effect on the condition. **Phototherapy** has been tried but with no success. In the mild form, however, the use of **Ethylmorphine Hydrochloride** is apparently of great value. A 2.5 to 5 per cent solution of ethylmorphine hydrochloride in a 1-5000 solution of mercuric cyanide was used by Gifford in most cases, a drop being instilled three or four times a day. The effect on the symptoms was in most cases almost immediate. By beginning with the weaker solution the resulting chemosis did not continue long enough after instillation to be a serious inconvenience, and in a few cases in which this was more prolonged a 1 per cent solution was used. Not only was the burning, scratching sensation relieved, but in cases with reduction of vision this usually improved after a few days' use of ethylmorphine hydrochloride. The staining arcus became fewer and less extensive, but never disappeared entirely in some cases, and in others did so only after weeks or months. Such cases showed punctate grey dots in the epithelium, and in all cases the epithelium continued to show a definite oedema during the period of observation. The corneal sensitivity remained reduced in most cases, as well. A number of patients were seen in whom symptoms disappeared entirely while ethylmorphine hydrochloride was used, but recurred some time after it was stopped, to disappear again when it was resumed. It was continued for long periods in most cases, the number of installations being cut down to one or two a day as symptoms subsided.

Another drug that seems of value is **Phenacaine**. Besides its anæsthetic effect, this drug is said to have a stimulating effect on the corneal epithelium, and in a number of cases a 0.5 per cent solution was used, either with the ethylmorphine hydrochloride or alone. A few cases that did not improve on ethylmorphine hydrochloride seemed to do better under phenacaine.

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CORONARY ARTERY DISEASE.

A. G. Gibson, M.D., F.R.C.P.

A. R. Barnes and R. G. Ball¹ give an account of the main situations of coronary thrombosis. Out of 49 cases of gross myocardial infarction, 28 showed a distribution in the field of the anterior descending branch of the left coronary artery, affecting the septum, the tip of the left ventricle, and the neighbouring parts of the wall of that ventricle. A very common site is on the posterior wall of the left ventricle. This is due to a thrombus in the termination of the main branch of the right coronary artery after it has encircled the right auriculo-ventricular groove. A similar distribution is seen when this part of the heart is supplied by the terminal branch of the circumflex branch of the left coronary artery. A rarer form is seen when the circumflex branch of the left coronary artery is affected as to a branch which

descends on the left border of the ventricle. The main clinical point that emerges is that in a case of coronary thrombosis the brunt of the disease falls on the left ventricle, and the failure of the heart therefore is of the left ventricular type.

In a review of a long series of cases of coronary thrombosis with post-mortems, J. C. Meakins and W. W. Eakin² record that out of 62 cases arrhythmias were seen as follows: extrasystoles 18, auricular fibrillation 8, gallop rhythm 4, and ventricular tachycardia 1. In 29 cases the rhythm was recorded as normal. The other interesting feature of this review is the tabulation of the existence of thrombosis in other systems, arterial and venous. In 4 cases only was thrombosis absent elsewhere. It was most commonly seen in the pulmonary arteries, where it could not be attributed to direct transference from mural thrombi, for this thrombosis was seen mainly in the left ventricle, and 15 cases showed arterial thrombosis without any mural thrombus in either ventricle. The authors assume that in this affection there must be some general tendency to thrombosis in the body.

W. H. Leake³ refers to some abnormal rhythms in coronary occlusion. Of 18 cases recorded by the author, 5 showed auricular fibrillation. Four cases showed ventricular tachycardia, and in 1 it occurred in short periods; in 1 case it was controlled by quinidine. Two cases showed complete heart-block.

In the course of a lecture on the clinical aspects of coronary disease, T. F. Cotton¹ makes some significant remarks on prognosis and treatment. The outlook is more favourable in those cases with true angina pectoris than in those with coronary occlusion with infarction. In the former type the patient may survive five years, in the latter seldom more than two or three. The prognosis must always be guarded, and the presence of gross structural disease increases the gravity. No definite prognosis can be given in the first three weeks of coronary occlusion whether the symptoms are mild or severe. After this, if there is improvement without gross cardiac signs, the patient may be expected to recover and even to lead a normal life.

In coronary thrombosis Cotton advises **Rest in Bed** for one month or preferably six weeks, saving the patient for the first fortnight every unnecessary movement. **Digitalis** should be given when there is congestive failure or fibrillation, and a convalescence of two months should be allowed before permitting gradual resumption of activity. Angina pectoris, on the other hand, is mostly treated while the patient is up and about, though a long rest may help the patient if the attacks recur at frequent intervals. **Chloral Hydrate** or **Morphine** may be used to lower the threshold for pain, and all physical and mental activities should be suspended. In cardio-aortic syphilis **Iodides** and **Mercury** should always be prescribed, and, in the early stages, intravenous injections of **Arsenic**. (*See also* CARDIOVASCULAR SYPHILIS.)

In a report on the prognosis of angina pectoris and coronary thrombosis, P. D. White and E. F. Bland⁴ state their view that the subject is becoming increasingly important because of its frequency in persons of responsible position. Of 500 cases of angina pectoris, 213 were dead with an average duration of life of 4.4 years after the onset of disease. Four-fifths of the patients died of chronic heart failure. About one-fifth of these had normal hearts, normal blood-pressure, and normal electrocardiograms. Of 200 cases of coronary thrombosis, on the other hand, the duration of life, provided that the patient survived the acute attack, was not appreciably affected. The electrocardiogram was of little help in predicting the outcome, though those patients that had the coronary T wave in Leads I or II showed a tendency to die earlier. Syphilis, poor heart-sounds, cardiac enlargement, congestive

failure, or marked arteriosclerosis made the prognosis worse. One of the most vital factors was the amount of care that the patient was able to give to the management of his health.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1932, Feb., 215; ²*Canad. Med. Assoc. Jour.* 1932, Jan., 18; ³*Calif. and Western Med.* 1932, March, 153; ⁴*Brit. Med. Jour.* 1932, i, 368; ⁵Abstr. in *Jour. Amer. Med. Assoc.* 1931, Dec. 19, 1919.

DEAFNESS. (See EAR, DISEASES OF.)

DEMENTIA PARALYTICA. (See NEUROSYPHILIS.)

DEMENTIA PRÆCOX. (See also MENTAL DISEASE, TREATMENT OF; PSYCHOSES, PATHOLOGY OF.)

DEMENTIA PRÆCOX, DYNAMISM IN. *H. Devine, M.D., F.R.C.P.*

In contrast to psychoses associated with definite structural decay of the brain, such as the senile dementias, the schizophrenic group often give the impression that nothing is irredeemably lost, since under certain conditions, such as a bodily illness, a normal reaction may be stimulated. This dynamic peculiarity of schizophrenics has suggested many methods of treatment, the purpose of which is to stimulate healthy reactions on the one hand, and to dissipate diseased or abnormal ones on the other. According to this dynamic conception, the static view of Kraepelin that the symptoms of dementia præcox are to be understood as manifestations of structural disease of the cortical cells is not accepted. On the contrary, it is assumed that the disease is to be conceived (at any rate in its early stages) as a phenomenon of dissociation and of psychic arrest the expression of a morbid distribution of psychic energy. "The precocious dement is a rich man whose capital is immobilized. Later he becomes a pauper."

Writing on this problem, C. Pascal¹ observes that the psychogenic view of dementia præcox poses the problem of the evaluation of the 'psychic capital' and its capacity for reintegration. She points out that the discrimination between the schizophrenic who is susceptible of rebirth and one who has become incurably fixated and static can only be ascertained by methods which are capable of elucidating the dynamic possibilities of the vital forces. She is of the opinion that objective clinical methods are incapable of solving this problem, as they fail to reveal the extent to which the patient is capable of gaining contact with reality. Pascal therefore utilizes what she terms the 'psycho-analytic pharmaco-dynamic method' as an aid to diagnosis and prognosis. The essential aim of the method is to establish above everything else the extent to which the lesions are destructive and irreversible on the one hand, and functional and reversible on the other. The drugs employed, either alone or in combination, are the following: **Ether Inhalations, Cocaine, Caffeine, Strychnine, Hashish, Mescaline, and Nitrous Oxide Inhalations.** The patients thus treated were mostly negativistic, intermittently mute, and apparently irremediably 'chronic'. When under the influence of the drug psychological stimuli are utilized. Thus the patient is subjected to: persistent attempts to elicit responses; association with dynamogenic words (Jung's association experiments); sensory excitation by means of music, odours, etc.; awakening of emotional memories by the presentation of such objects as photographs, letters, and personal belongings; and the evocation of events which have left behind profound emotional sensitivity.

Forty-three patients were submitted to these methods of stimulation, all of whom presented definite and indisputable signs of dementia præcox. Only 3 of these presented states of agitation. The others were negativistic and

permanently or intermittently mute. In the majority of the cases (29) the pharmacodynamic excitants dominated the autism without dissipating it altogether. The most negativistic and hostile changed their affective attitudes and became amiable, gracious, and polite. In some cases it was possible to follow the psychic rhythm, the effort in the direction of reintegration, and the progressive or brusque return to disintegration. The negativism (principally the mutism) fell like a mask under the influence of the excitants in the greater number of the cases. In the remaining cases the excitations failed to loosen the resistances. The writer suggests that the methods she describes might with advantage be introduced into the practice of psychiatry. In none of the patients were the drugs found to have produced any harmful effects.

Somewhat similar methods of investigation have excited considerable interest in America. In the MEDICAL ANNUAL of 1930 (p. 338) we summarized the work of Lorenz, Loevenhart, and others on the reactions of confirmed catatonic patients resulting from the administration of carbon-dioxide-oxygen stimulation. In a number of these patients normal reactions were elicited for varying periods, and after the effects of the inhalation had worn off the patients once more sank back into their stupor. Since then it has been found that **Sodium Amytal** produces similar results in schizophrenic patients. W. J. Bleckwenn,² who records his experience of this drug in the treatment of fifteen cases of catatonic patients, points out that Lorenz suggested several theories in explanation of the reactions exhibited by his patients on the basis of cellular oxidation and cortical stimulation. Now it would appear that an entirely different drug, apparently a cortical depressant, is more effective in the stimulation of catatonic patients. It would thus appear that the foregoing explanations are no longer tenable. Bleckwenn believes the recent explanation of Lorenz to be the most reasonable. In substance this is as follows: That an individual develops a psychosis following normal mental life. Assuming that this psychosis in the case of catatonia is at a much lower level of mental existence than the normal, and may be even a subjugation to the more primitive fetal existence, yet it is not so deep as real unconsciousness. If at this point one precipitates a catatonic patient into unconsciousness by the use of a narcotic or anæsthetic one pierces through this level of catatonic stupor and dislodges the catatonic mechanism. Upon the return from unconsciousness induced by the drug the catatonic patient mentally approaches the so-called normal. After he has regained this normal mental life, the various factors and stimuli responsible for his original psychosis become effective; and after a period of hours he reverts back to this more primitive level which is apparently a more desirable refuge.

Regardless of any theoretical considerations, the fact remains that catatonic patients can be roused from their stupor for intervals of from two to fourteen hours, during which, if previously tube-fed, they eat ravenously, show spontaneity, and ask and answer questions with consistent emotional reactions. Thus the drug offers an opportunity for the daily approach and psychological study of a mental condition previously only accessible during acute febrile states and following spontaneous remissions. There is nothing specific as far as the use of sodium amytal is concerned. Many of the other barbituric acid derivatives may have similar effects.

The writer's purpose was to induce deliberately a profound narcosis in catatonia. The best results were obtained with the intravenous injections of the drug. From 10 to 15 gr. were administered, and, following the initial intravenous dose, some of the cases have been treated with daily intramuscular injections. Others required the more profound narcosis obtained by the intravenous method. Some of the cases have received daily injections for two

months. There does not seem to be any increased tolerance for the drug. In all, 15 cases of catatonia have been studied. Of these, 4 have failed to talk. They, however, obey commands. Only one of the cases failed to take food by the mouth, following the injection of the drug. As a result of the daily use of this treatment the patients are gaining physically. The so-called 'normal lucid intervals' vary from four to fourteen hours, during which several hearty meals are taken. Many of the cases give valuable hints as to the possible fundamental mechanisms that may have contributed to their schizophrenia. The writer feels that it is perfectly possible to prophesy that, given an accessible approach to catatonia, the physiological and psychological study of the illness should help immeasurably to clarify what is at present an obscure mental condition. Furthermore, it may even be hoped, as a result of such analysis, to apply psychotherapy to advantage in cases where it has never been possible before. In the MEDICAL ANNUAL of 1932 (p. 300) details are given of the method of administration and the dosage of amytal.

Such researches are both interesting and important. Pascal observes that the investigation of the dynamism in these cases must be the basis of diagnosis, prognosis, and therapeutics of dementia præcox. It enlarges the psychiatric outlook, satisfies the therapeutic impulse, and permits the assumption that schizophrenia is a curable disease and not necessarily an irreversible state of dementia. The fact that confirmed hebephrenics, under the influence of certain drugs, are capable of exteriorizing their thoughts and maintaining for a time a normal reaction to their environment, at least gives ground for the hope that more enduring recoveries may in time be effected.

REFERENCES.—¹*Presse méd.* 1932, April 13, 569; ²*Proc. Assoc. Research in Nerv. and Ment. Dis.* 1931, x, 224.

DERMATITIS VENENATA. A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Bakers' Dermatitis.—F. S. Hausman¹ has investigated three cases of dermatitis occurring in bakers (in two cases the patients had been baking for thirty years and in one for twenty years). In all three cases a 'yeast food' containing ammonium persulphate was used. The skin of these patients was tested by both scratch and patch tests to varying strengths of ammonium persulphate solutions. The skin of the abdominal wall in all three patients gave a positive reaction to the patch test when a 1 per cent solution was used, accompanied by a lighting up of the original patches of dermatitis. Six control cases gave negative results. The scratch test gave indecisive results, as did the Prausnitz-Küstner reaction. The author also tested various chemical substances on the skin of the affected persons, and came to the conclusion that the persulphate radical was responsible for the results obtained. He concludes, in opposition to Prosser-White, that ammonium persulphate is the cause of dermatitis in certain dough-mixers and that the allergic nature of this substance has been demonstrated. He thinks that the use of this substance in dough-making should not be permitted unless manual contact with the dough is prevented until the dough has 'quickened'. Where all the dough is mixed by machinery there is no reason why the use of ammonium persulphate should be prohibited.

C. Badham² obtains similar results. An outbreak of dermatitis among the bakers of New South Wales began within a few months of the introduction—in March, 1929—of potassium or ammonium persulphate to the activators (accelerators or yeast foods) used in dough-making. These compounds are generally composed of a base of wheat, malt, flour, and chloride of ammonium, 2 to 3 per cent of persulphate being added to the mixture. The outbreak of dermatitis continued while the persulphate was used, and rapidly subsided—in October, 1930—when it was no longer added to the activators.

Ephedrine.—S. Ayres, jun., and N. P. Anderson³ describe two cases of local dermatitis associated with general eruptions in two patients who used ephedrine in a nasal spray and also took the drug internally. In the authors' first case the local reaction occurred on the nose and upper lip and consisted of an erythematous itchy eruption. Later an erythematous scarlatiniform eruption developed which became generalized; there was oedema of the legs and purpuric lesions developed in this area. Slight fever was present and an elevated pulse-rate. In the second case the nose and upper lip were similarly affected, and later on a generalized blotchy macular erythematous eruption developed, morbilliform in type. The condition gradually cleared on cessation of the drug and desquamation occurred, the palms exfoliating as in scarlet fever. The patient took ephedrine subsequently by the mouth, and this was followed by the appearance of swelling of the nose and upper lip and the development of wheals on the thighs and ankles. Patch tests were positive to ordinary ephedrine but negative to synthetic ephedrine in this case. Passive transference by the Walzer modification of the Prausnitz-Küstner reaction was unsuccessful.

Oranges and Lemons.—Sybil G. Horner⁴ has investigated cases of dermatitis occurring in workers preparing oranges and lemons for marmalade. She finds that the condition occurs chiefly among 'peelers', who handle the skin of these fruits. 'Orange oil' occurs only in the peel of the orange and consists of 90 per cent dextro-limonene. Limonene is a terpene—a hydrocarbon group whose irritant action on the skin is exemplified in the turpentine. Pinene, believed by certain American investigators to be responsible for the irritant action on the skin, is not only closely related to limonene, but is also present in lemon oil, together with camphene and octylene (a hydrocarbon differing from the terpenes). So nearly are lemon oil and turpentine related that the latter was at one time a common adulterant for lemon oil. The author suggests that limonene might well be the cause of dermatitis in lemon and orange peelers. The rind of these fruits, particularly the bitter orange, contains a number of oil vessels which readily become ruptured on handling—a risk which is augmented by the practice of steaming the fruit preliminary to peeling. It was found that when the exposed skin was oiled before beginning work, injury was rarely sustained.

Procaine.—B. M. James⁵ describes a case of dermatitis of the eyelids and surrounding skin due to the use of a 1 per cent procaine solution used as eye-drops. The patient was found to be highly sensitive to procaine by the patch test. Guy Lane has previously called attention to susceptibility to procaine among dentists, and Galewsky has noted dermatitis from procaine eye-drops.

Shoe Leather.—G. M. Lewis⁶ describes two cases of dermatitis of the feet and ankles. Both cases gave positive patch tests to the leather of the shoes. The author points out that the various processes through which the leather employed in shoe-making passes are so varied and complicated that it is often impossible to trace the actual chemical substance responsible for the dermatitis.

REFERENCES.—¹*Med. Jour. Australia*, 1931, July 25, 94; ²*Report of Director-General of Public Health, New South Wales, for year ending Dec. 31, 1930*, p. 71; ³*Jour. Amer. Med. Assoc.*, 1931, Aug. 15, 437; ⁴*Lancet*, 1931, ii, 961; ⁵*Jour. Amer. Med. Assoc.*, 1931, Aug. 15, 440; ⁶*Arch. of Dermatol. and Syph.*, 1931, Oct., 597

DIABETES.

John H. Anderson, M.D.

In the past twelve months the swing towards the higher-carbohydrate-lower-fat diet has continued, and an important discussion which took place at the Royal Society of Medicine last year is summarized below. Such a diet has many advantages, but certain difficulties present themselves, more particularly

in the severe cases. The success of this type of diet is making certain observers ask if it does not render untenable the popular conception that diabetes is merely due to a deficient production of insulin. E. P. Joslin has written an appraisal of the present treatment of diabetes, and finds the methods employed better than is often thought. As a result of the control of the primary disease, complications—especially those of the cardiovascular system—are assuming a more important place in our scheme of treatment and management. Though the year has not apparently produced any one publication of outstanding importance, there is much food for thought and reflection in the papers appearing in the various journals.

ETIOLOGY.

I. S. Wright¹ considers that a careful questioning will increase the recognized incidence of the *hereditary factor* in diabetes. He quotes one case in which two diabetic parents had 13 children; of these 9 developed diabetes and the remaining 4 "died of a questionable disease in Russia during the World War". The

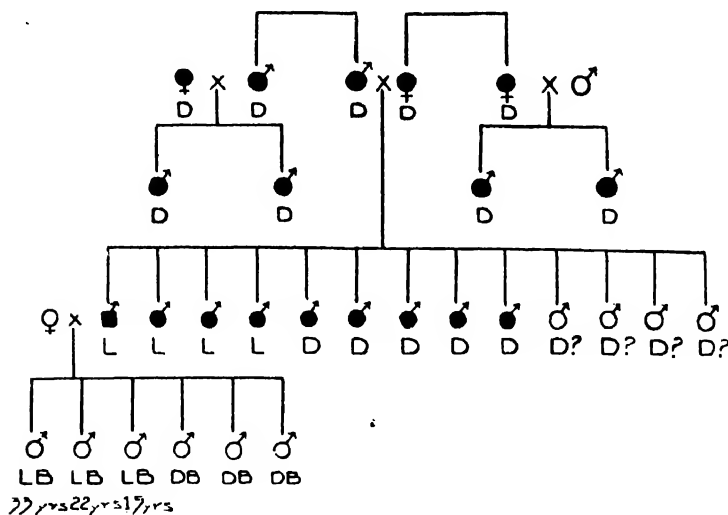


Fig. 18.—Genealogical tree showing familial diabetes and haemophilia, and male dominance in transmission. (From the 'American Journal of the Medical Sciences'.)

family tree is extraordinary (Fig. 18), and shows: (1) the familial tendency of diabetes, (2) a male dominance in transmission, and (3) the presence of haemophilia in five brothers. The author notes also the frequent association of obesity with diabetes, and his cases support Cammidge's contentions, that diabetes is transmitted in human beings according to Mendelian laws and that when the characteristic is dominant the disease tends to be mild (MEDICAL ANNUAL, 1932, p. 119).

COMPLICATIONS.

In a series of 827 cases treated in hospital between 1922 and 1930, F. D. Murphy and G. F. Moxon² found that over 82 per cent showed some complication. The cardiovascular group was the largest (33 per cent), and infection in some form (excluding pulmonary tuberculosis) came next (10 per cent), dental caries being present in 7 per cent. Only one of the uncomplicated cases died, but the mortality-rate in the group with complications was over 35 per cent. This high figure is explained by the advanced state of the disease when many of the patients entered hospital, and also the advanced age of many others. "Delay in beginning treatment was an outstanding cause of death." The writers stress the danger of infection in diabetes; pneumonia and pulmonary tuberculosis being particularly badly borne. Of 20 cases of primary coma only 2 died (10 per cent), but in secondary coma, i.e., following a severe infection or serious complication, the death-rate was nearly 77 per cent (10 out of 13 cases). Murphy and Moxon suggest that when a diabetic's progress continues to be unsatisfactory after he has been rendered sugar-free, the presence of some complication should be seriously considered; uncomplicated diabetes is usually a benign disease, but in the presence of one of the many possible complications it becomes a grave one. "The prevention of complications should be the aim in the management of diabetes"; early diagnosis and thorough treatment are essential for this.

Figures from the Mayo Clinic, reported by F. N. Allen,³ give a somewhat similar result, 1386 complications being noted in 840 cases. Heart disease, gall-stones, and peripheral neuritis, in that sequence, were the most common. "The treatment of patients with diabetes involves much more than the treatment of the diabetes. The diagnosis and treatment of associated conditions and complications is often the most important problem."

Arteriosclerosis.—Cardiovascular disease in diabetes is engaging the attention of physicians more and more, for, as Joslin says, "Every other diabetic now dies of arteriosclerosis, and the percentage of such cases has been rapidly rising." S. Strouse and his co-workers,⁴ who have carefully studied the literature in addition to their own series of cases, re-affirm the deleterious effect of insulin hypoglycemia on the heart, especially in older patients with cardiovascular disease. "It is possible that, for such patients, the higher blood-sugar levels usually found do represent the 'normal' or optimum value, as far as their cardiovascular state is concerned." They conclude with a plea for the demands of the diseased myocardium and that its needs should not be forgotten by the physician in his efforts to control the metabolic manifestations of diabetes. L. W. Dunlop⁵ concurs strongly in this view; "since the advent of insulin, arteriosclerosis has become a subject of great interest" and "has unexpectedly developed into a problem of major importance in diabetes."

Pregnancy.—B. D. Bowen and N. Heilburn⁶ describe 5 new cases of pregnancy in diabetes and also review 73 cases previously published. They find that while insulin has markedly lowered the death-rate, we are still far from the obstetrical ideal as regards both mother and child; the greatest danger being acidosis and coma. Clinical evidence supports the view that pregnancy, in the majority of cases, increases the severity of the disease, at least temporarily, though there is a great variation of tolerance and insulin requirements during both the gestation period and the puerperium. "It would seem that the whole subject of carbohydrate metabolism during pregnancy is exceedingly complex and that each patient must be treated individually." If the amount of insulin has been markedly increased during pregnancy, it is generally wise to reduce the dose during the puerperium.

TREATMENT.

Diet.—The use of a higher carbohydrate diet in the treatment of diabetes was referred to in last year's MEDICAL ANNUAL (p. 124), and this aspect of treatment was fully discussed by the Section of Therapeutics and Pharmacology of the Royal Society of Medicine in February, 1931.⁷ After tracing the evolution of diets from the undernutrition or pre-insulin days, E. P. Poulton gave details of a series of patients, of varying ages, treated with varying amounts of carbohydrate. He postulates 250 gm. of carbohydrate as being a normal daily intake for a healthy adult and 200 gm. for middle childhood. On this assumption a diet containing not less than 100 gm. is regarded as a 'higher carbohydrate diet' when compared with the usual standards among diabetics. In 10 adult patients who were tried on the low and the higher carbohydrate diet, it was found that in 7 the carbohydrate to insulin ratio was increased on the higher diet, "indicating that a given quantity of insulin becomes capable of dealing with more carbohydrate when the fuller diet is employed." Poulton regards the course of the disease as being no more unfavourable in adults with the high or normal, than with the low, carbohydrate diet; in children, several cases showed improvement. In all cases the amount of insulin was raised to a point sufficient to keep the blood-sugar within normal limits during the twenty-fours, and, where higher diets were given, the insulin injection was made as long as possible before meals. Poulton does not advocate higher carbohydrate diets if they necessitate three doses of insulin a day. The cost of insulin and the mechanical difficulties consequential on large doses (over about 100 units a day) may also be disadvantages to a high carbohydrate diet. On the other hand, such a diet is of distinct advantage in the presence of such complications as phthisis, circulatory disturbances, and a lowered renal efficiency. Poulton's observations have extended over two and a half years, and he advocates the method in general for patients taking insulin. One diet which contained 315 gm. of carbohydrate, 102 gm. of protein, 143 gm. of fat, giving a total of 3040 calories, required 66 units of insulin at first, but only 40 units some eight months later; in the interval the weight increased from 147 to 170 lb. The author's diet tables are carefully prepared, the carbohydrate to fat ratio varying from 1:1 to 4:1; they naturally include many articles of food as a rule forbidden in a diabetic menu.

R. D. Lawrence⁷ agrees that it is advisable to give considerably more carbohydrate than was allowed when insulin was first introduced, but doubts the wisdom of a diet containing more than 70 to 120 gm. of carbohydrate. He found difficulty in balancing the carbohydrate and the insulin on higher carbohydrate diets, and in his experience the glucose-insulin equivalent did not rise as Poulton described. In Lawrence's opinion the most important point was to construct a diet on which the patient could live most normally, comfortably, and economically.

J. A. Nixon⁷ allows his patients to choose what they consider their normal diet, omitting articles which contain sugar as such. This diet is estimated, any obvious discrepancies are corrected, and then sufficient insulin is given to balance it. A maintenance diet of 1600 calories contained as a rule 100 to 150 gm. of carbohydrate, and a full diet of 2500 to 3000 calories might show 300 to 400 gm. of carbohydrate. Nixon prefers to describe these diets as containing 'adequate' rather than 'high' amounts of carbohydrate.

G. Graham⁷ in a series of 16 cases found it possible to increase the amount of carbohydrate given, the amount of the increase varying from 30 to 57 gm. Three patients required slightly less insulin (2 units), 3 could do on the same amount, but the other 10 required more insulin (6 to 20 units). He found great

variation in different patients, and in the same patient at different times, with regard to the amount of extra carbohydrate looked after by extra insulin. He feels that the key to success lies probably in the balance between the fat and the carbohydrate. The fat should be kept low, as in his experience patients on high carbohydrate diets were more liable to develop ketosis under any added stress.

A. P. Thomson⁷ regards 100 gm. of carbohydrate as the minimum necessary for adequate dieting in the great majority of cases, and often gives a good deal more, particularly in children. The amounts of protein and fat he leaves to the appetite of the individual patient, varied according to the daily demands of his life.

P. J. Cammidge⁷ deprecates the relatively high proportion of fat in many diabetic diets. A diet relatively rich in carbohydrate is particularly useful in such complications as nephritis and heart disease, as the reduction of nitrogenous waste spares the kidneys and improves the nutrition of the cardiac musculature.

His experience with high carbohydrate diets leads M. Rabinowitch⁸ to inquire why these diets are successful, and further whether such success is compatible with the present conception of the metabolism of diabetes. "The view generally held at present is that, in diabetes, there is a defective production of insulin. Much of the experimental data to date fails to support this view. Diabetes does not appear to be due to defective production of insulin, but to interference with the action of a normal supply." In support of this contention Rabinowitch refers to the not infrequent experience in cases of infection, where patients fail to respond to insulin injected hypodermically. He prefers the phrase 'high-carbohydrate-low-calorie diet', and considers that every patient should be kept about 7 to 10 lb. underweight. (He proposes a simple method to estimate the proper height-weight relationship. Individuals are divided into four groups, according to their ages, namely, 15-25, 26-30, 31-35, and 36 years upward. Assuming all to be 5 ft. in height, the corresponding weights of the different groups for their height are 120, 125, 130, and 135 lb. respectively. Allow 3 lb. in weight for each inch above 5 ft., and in the case of females deduct 5 lb. from the final figure. Thus a male, aged 33 years, height 5 ft. 6 in., should have a normal body weight of $130 + (6 \times 3) = 148$ lb. The normal body weight of a female aged 38 years, 5 ft. 4 in. in height, is $135 + (4 \times 3) - 5 = 142$ lb.) Diets in cases quoted run as follows, and serve to illustrate the proportions used: 254 gm. of carbohydrate, 75 gm. of protein, 45 gm. of fat; 272 gm. carbohydrate, 78 gm. protein, 45 gm. fat. In 500 cases, 16 failures occurred, and Rabinowitch regards those as due in the main to dietary indiscretion, inadvertent or deliberate, on the part of the patient.

In J. H. Barach's⁹ hands the high-carbohydrate-low-fat diet has proved successful. He feels that "the diabetic patient tolerates carbohydrate better than fat, and that, gram for gram, carbohydrate throws less strain on the metabolism." In his experience fat is more dangerous to the diabetic than carbohydrate.

For the past six years the diet at Salford Royal Hospital for diabetic patients on insulin has contained a liberal allowance of carbohydrate. A specimen diet for a man of average weight is 165 gm. of carbohydrate, 83 gm. of protein, and 126 gm. of fat. C. S. D. Don¹⁰ has analysed the results seen in certain of these cases, after discharge from hospital, for varying periods up to six years. With regard to the insulin requirements the dose was reduced in 17, increased in 20, and remained as before in 20. In 19 out of the total of 171 cases insulin was stopped, but had to be restarted in 8. The blood-pressure in treated cases

showed an increase above 151/100 in just over half of those who had been on insulin for an average period of three years.

S. C. Dyke¹¹ agrees with J. A. Nixon⁷ and gives a diet containing at least 100 grm. carbohydrate "at the onset of the treatment, no matter what the state of the patient." Insulin is given freely, 100 units or even more, and if necessary in four doses. When the blood-sugar is within normal limits and the urine sugar-free, the diet is increased to about 2000 calories with 125-150 grm. carbohydrate. After stabilization the diet is increased again to the calorie requirement of the subject. The insulin given varies according to the condition of the patient's blood-sugar and urine. Dyke aims at reducing the dose to one in the twenty-four hours if possible, and considers that if the daily requirements do not exceed 40 units a single morning dose is as a rule all that is necessary, even on a diet containing up to 150 grm. carbohydrate. [No detailed diets are given in his paper and it is not possible to know at which meal the main part of the carbohydrate is given.—J. H. A.] Dyke stresses the need for hospital control at first. "It is difficult—in fact almost impossible—to carry out treatment in the early stages satisfactorily except in an institution", even in the relatively mild cases.

E. P. Joslin,¹² after a careful survey of available statistics, believes that the average diabetic in America who has been under the direct care of a physician receives about 150 grm. of carbohydrate a day. To his mind, avoidance of overweight is a fundamental principle of treatment, and discussions and differences as to details in the make-up of the total calories are of minor importance in comparison. With this F. M. Allen¹³ agrees, and adds that he has always endeavoured to avoid the extremes of high fat and high carbohydrate. Joslin¹² puts the same point very neatly when he writes "as for fat and carbohydrate, I like to look on them as two children who sit on opposite ends of a seesaw and the more one goes up the more the other must go down, but both are safe if the seesaw is not overloaded or so high that either end reaches an extreme position." Protein for the young child should be about 3 grm. per kilo of body weight and 1 grm. to 0.6 grm. for the adult or nephritic patient. Joslin gives as his considered opinion that "the present treatment of diabetes is better than is often thought, and, therefore, one should be slow to depart from standard methods." Many workers hold that the excess of fat in many diabetic diets has a direct bearing on the frequency of arteriosclerosis in the later stages of the disease. This is an important practical point, and the change in the amount of blood-cholesterol has been noted in several cases when the fat in the diet has been replaced by carbohydrate. The number of cases published so far is not sufficient to allow of any definite conclusion being drawn.

Summary.—In the last few years the carbohydrate moiety of the diet of the average adult diabetic under insulin therapy has steadily increased, with a consequential fall in the amount of fat. The general consensus of opinion points to 100 to 150 grm. of carbohydrate as a reasonable amount, though 300 grm. carbohydrate have been given in individual cases. The advantages of the high carbohydrate diet include more variety and scope in the food, and, as a result, less temptation for the patient to 'break diet', a lessened liability to acidosis, and a better protection in the presence of complications. Proof is still wanting as to whether the addition of carbohydrate and reduction of fat is always followed by a lowering of the blood-cholesterol, and, even if such is the case, what effect this has on the incidence of arteriosclerosis. On the other side, it is more difficult to control the glycaemia in many cases on a high carbohydrate intake, and the chance of insulin reaction is somewhat increased; generally more insulin is required, and this may present financial and mechanical difficulties.

[In the writer's opinion more conclusive information will be gained when a sufficiency of cases has been studied in groups classified according to the severity of the disease, mild, moderately severe, and severe. In a severe case of diabetes in a girl recently seen, the use of the higher carbohydrate diet produced a greater sense of well-being, a steady gain in weight, a reduction of the glycosuria, and the disappearance of acid bodies from the urine. At the same time there was great difficulty in getting the morning blood-sugar steady and within normal limits, and in clearing the sugar from the urine passed daily between 8 a.m. and 12 noon. The same patient did better on 60 units of insulin given in three doses than on 80 units in two doses. A case at present under observation, a girl age 15 years, is exhibiting similar tendencies. Some patients prefer to continue with the older type of diet. A man of 29, who has been for some years on a diet with a carbohydrate-fat ratio of 1:3, leads a normal life, with a clear urine and normal blood-sugar values. The advantages of the higher carbohydrate diet have been fully discussed with him, but he refuses firmly even to give it a trial. —J. H. A.]

The value of the **Jerusalem Artichoke** has been carefully investigated by H. B. Stein¹⁴ and his co-workers. They regard it as a useful vegetable to furnish variety to a prescribed diet, but do not consider that carbohydrate from this source offers any advantages over those usually given. In their hands—and their work was carefully planned and checked wherever possible—the special claims sometimes made for this tuber as an article of diet are not substantiated. Much the same result was reached by S. Soskin, H. F. Binswanger, and S. Strouse¹⁵ in a smaller series of cases.

Insulin.—Insulin is so largely used in the treatment of diabetes that the question of its freedom from contamination is an important one. It is claimed that the acidity of insulin solutions is such as to protect the fluid against accidental infection, so that the addition of preservatives, generally of the phenolic group, is unnecessary. Working with a strain of *Staph. albus*, P. Hartley¹⁶ found that “provided the normal acidity of insulin solutions is maintained, the danger of infection from casually introduced micro-organisms is not serious”. “A slight change in the reaction towards the alkaline side not only destroys this germicidal action, but converts the solution into a culture medium if no preservative is present.”

The fact that insulin loses some of its power in the presence of certain complications of diabetes is generally accepted. W. Falta and R. Boller¹⁷ find that certain cases of endocrine imbalance, liver disorders, encephalitis, and psychic disorders can show a similar resistance to insulin in the absence of any complication. Elderly patients with obesity and arterial hypertension often exhibit the same tendency. Falta and Boller feel that “human diabetes mellitus cannot always be explained by an insufficient function of the islands of Langerhans”. (Reference has already been made to the arguments advanced by Rabinowitch in support of the same conclusion.)

Insulin Substitutes.—**Synthalin** remains the only rival to insulin in the treatment of those diabetics who cannot be controlled by diet alone. A. T. Todd and his co-workers¹⁸ at the diabetic clinic of the Bristol Royal Infirmary now treat about 70 per cent of their cases with synthalin. They claim “the system is easy to carry out” and gives “much less trouble to the patient than insulin”, while the cost is about the same. In their opinion synthalin exerts “its action either by lowering the cellular threshold for glucose-insulin metabolism, or, more probably, it acts by depressing glycogenolysis, thereby increasing the secretion of endogenous insulin.” Their claim for simplicity of method does not seem borne out on closer examination. In addition to a diet with a calculated carbohydrate-fat ratio, the patient takes synthalin and

a proportionate amount of decholin on specified days, a mixture three times a day, bemax or marmite once daily, and liver and sweetbreads on certain days. Given with these precautions the depressant effect of synthalin on the liver can be avoided.

At the diabetic clinic of the Birmingham General Hospital synthalin has also proved of use in the hands of A. P. Thomson, R. J. Gittins, and G. Thomas¹⁹ in cases of diabetes of mild or moderate severity. In this series, though the synthalin was given apparently without any safeguards such as described above, toxic symptoms only appeared in rare cases and then were of a mild nature. It is to be noted, however, that in certain patients insulin had to be substituted for, or used as an adjuvant to, the synthalin. The uncertainty of the action of synthalin is well illustrated by some of Thomson's cases. By adding synthalin, the blood-sugar fell in 35 cases, but rose in 9; on withdrawing the drug the blood-sugar rose in 12 cases and fell in 7. It is possible that experiences of this kind may have influenced Sir William Willcox²⁰ in making the statement "Synthalin does more harm than good." [A careful study of the two papers outlined above would seem to disprove any case for synthalin as a substitute for insulin when the latter is available. The disadvantage of medication by hypodermic injections is more than counterbalanced by the other advantages of insulin. This conclusion is shared by the great majority of observers who have studied the actions of the two drugs.—J. H. A.]

Surgical Treatment.—Animal experiments have shown that ligation of the tail of the pancreas is followed by certain regular changes in the part so isolated. The acini degenerate, and there is a general sclerosis, in which, however, the islands of Langerhans do not take part, but, on the contrary, show hyperplasia and hypertrophy. On theoretical grounds this should lead to an increase in carbohydrate utilization, and in normal dogs such has been shown to be the case. G. de Takats²¹ has now carried this work a step further, and, after isolating the tail of the pancreas by a band of fascia in two selected cases of juvenile diabetes, has demonstrated an increase of carbohydrate tolerance after the operation. The brilliancy of his operative technique is only equalled by his caution and his moderation in drawing conclusions, for he writes: "a longer period of observation and further trial on other cases promise a better evaluation of such results".

RENAL GLYCOSURIA.

Before a case can be regarded as one of renal glycosuria, A. Marble²² considers it should show a glycosuria due to glucose, without hyperglycaemia, and independent of diet; a blood-sugar influenced only slightly by the ingestion of food; an absence of the characteristic symptomatology of diabetes mellitus; and no progression toward true diabetes over a period of three years. A normal respiratory quotient and a normal metabolism, before and after a carbohydrate meal, are two other useful differentiating criteria; further, a common finding in renal glycosuria is a history of glycosuria in the patient's relatives. In addition to his own cases Marble has surveyed the literature very thoroughly, and, in an analysis of 9000 cases of glycosuria, can accept only 15 cases as conforming to his standards: 2 cases of 'essential' pentosuria were also discovered. Of the 15 cases recognized as true renal glycosuria none progressed to the more sinister form, though cases were under observation for long periods, in one instance over thirty-six years. As a rule the glycosuria was first found early in life, in 9 cases under the age of ten years. No evidence of nephritis was seen, and in 11 of the 15 cases there was a history of glycosuria in relatives.

F. Parkes Weber²³ describes a family group of a mother and four children, all of whom have glycosuria without hyperglycemia, but whom he hesitates to term 'renal' diabetes, excepting in the sense that the glycosuria is due to a low renal threshold for sugar, from a congenital developmental condition. The mother "must have been passing sugar in the urine for forty-four years without being any the worse for it." As Parkes Weber shrewdly remarks, cases of this kind of glycosuria may increase the difficulties of diagnosis when any infection or temporary illness occurs. Thus one son, when overseas, was seen in an attack characterized by mild vomiting and headache and was regarded and treated as a case of threatened coma. Sugar-tolerance curves carried out some weeks later, at the instigation of the medical man cognizant of the urinary peculiarities of other members of the family, cleared the diagnosis. It is also interesting to note that a daughter of the same mother, but by a different father, has, together with her own child, apparently escaped the familial glycosuria.

DIABETIC COMA.

Increasing attention has been paid in recent years to the variation of the blood-urea in diabetic coma, particularly as to the significance of its increase as a guide in prognosis. A. Lyall and A. G. Anderson²⁴ have examined this point in 17 patients who have presented twenty examples of diabetic coma in the last five years. Care has been taken to exclude any case which showed cardiovascular or pre-existing renal disease. In their series, where the blood-urea was normal, there was only 1 death; in 13 cases where the blood-urea was increased, but did not exceed 100 mgrm. per cent, 1 death took place; but in 6 cases where the blood-urea was over 100 mgrm. per cent 4 cases ended fatally. Lyall and Anderson modestly regard their series as too small for statistical purposes, but feel that their results, taken in conjunction with those of other observers, make it clear that blood-urea estimation is of great value in prognosis in cases of diabetic coma.

The cause of the increase is not yet clear. One theory is that it is due to a reduction in the volume of the blood-plasma, with a consequent relative increase in the concentration of the chemical constituents. Such a dehydration may be contributed to by polyuria, loss of fluid by vomiting, lack of fluid intake, and excessive excretion of water vapour by hyperpnea—all clinical features of coma. Another suggestion is that the increase is due to the chloride loss of both blood plasma and tissues following a prolonged acidosis. It is generally accepted also that in severe diabetes there is an excessive breakdown of protein, particularly in the pre-coma stage, and this may increase the urea content of the blood in coma. "If any degree of renal failure is super-added to these factors already at work, nitrogen retention proceeds rapidly." The kidney is implicated in the majority of coma cases, though these renal changes are transitory if recovery takes place. Lyall and Anderson conclude "that in cases with a blood-urea over 100 mgrm. per cent the mortality is markedly increased. The blood-urea may increase during the early stages of coma, but begins to fall within thirty-six hours if recovery is to take place."

MISCELLANEOUS.

As a rule the *diagnosis* of diabetes mellitus is readily established by examination of the urine, estimations of the blood-sugar, and the study of a sugar-tolerance curve. Pitfalls, however, do exist, for M. Wishnofsky and C. S. Byron²⁵ point out that a high fasting blood-sugar and a high blood-sugar curve after the ingestion of dextrose may exist in such conditions as hypertension, nephritis, and hyperthyroidism. In such cases the respiratory quotient curve

may afford valuable help. They give 1.75 gm. of dextrose per kilo of body weight and consider that the respiratory quotient should rise to 0.88 within two and a half hours if the case is to be considered normal. Two cases of hypertension and two of hyperthyroidism are described in which a final diagnosis was only arrived at after a respiratory quotient curve had been done.

In most laboratories the blood-sugar curve obtained after the ingestion of a measured amount of dextrose is discontinued at the end of three hours. E. P. Ralli and J. Shannon²⁶ have prolonged the investigation for a five-hour period in both the normal and diabetic patient. Their results may be tabulated as follows:—

TYPE OF CASE	GREATEST HYPERGLYCAEMIA	RETURN TO STARTING POINT
Normal	$\frac{1}{2}$ –1 hour	2–3 hours
Mild diabetic	1–2 hours	3–4 hours
Moderately severe diabetic	Variable periods	4–5 hours
Severe diabetic ..	Markedly elevated for entire five-hour period	

They suggest that the blood-sugar level taken four hours after a meal is a better index of the severity of the disease than the starving blood-sugar.

E. M. Watson²⁷ is not able to support the views as to the presence of *eosinophilia* in insulin-treated diabetes previously recorded by R. D. Lawrence and O. B. Buckley in 1929. Seventy differential blood-counts from 43 diabetics receiving insulin showed a definite eosinophilia in only 1 case, and the average percentage of eosinophils in diabetics receiving insulin did not appreciably differ from the results obtained in a group under dietetic treatment only.

In every disease the *aim of treatment* is to enable the patient to resume as normal a life as possible. The extent to which this is being done in diabetes is set out by F. N. Allen²⁸ in his survey of a year's work by the Mayo Clinic. "With effective treatment, diabetes has come to have less effect on the lives and on the deaths of the persons affected. Treatment is no longer so disagreeable and unpleasant. With insulin it is possible to give a diabetic patient all the food he needs and almost all he wishes. The disease need not interfere with school or college education. It will probably have little effect on expectancy of life. This is the situation with good treatment. Unfortunately, a large proportion of diabetic patients fail to receive adequate treatment. Mild cases go with little, if any, attention, and severe cases have only partial control. The difficulty arises from the fact that such patients may seem well enough and the consequences of neglect are not appreciated. Yet, failure to control diabetes completely may lead to trouble in various ways. There may be insidious impairment of health and vitality; there may be progression of mild diabetes to a severe grade; there may be susceptibility to infections and degenerative changes in arteries, nerves, and eyes; and, finally, there may be risk of death from coma, particularly if the condition is aggravated by a complication. Most of these dangers can be avoided by thorough treatment."

These are brave words and furnish us with a fine standard to aspire to.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1931, Oct., 484; ²*Ibid.* Sept., 301; ³*Proc. Staff Meetings of Mayo Clinic*, 1932, Sept. 7, 319; ⁴*Jour. Amer. Med. Assoc.* 1932, May 14, 1703; ⁵*Med. Jour. of Australia*, 1931, Oct. 31, 533; ⁶*Amer. Jour. Med. Sci.* 1932, June, 803; ⁷*Proc. Roy. Soc. Med.* 1931, July, 1291; ⁸*Canad. Med. Assoc. Jour.* 1932, Feb., 141; ⁹*Jour. Amer. Med. Assoc.* 1932, April, 1265; ¹⁰*Brit. Med. Jour.* 1932, ii, 52; ¹¹*Lancet*,

1932, i, 978; ¹²*Jour. Amer. Med. Assoc.* 1931, Aug., 595; ¹³*Ibid.* 601; ¹⁴*Arch. of Internal Med.* 1931, Aug., 313; ¹⁵*Amer. Jour. Med. Sci.* 1931, Nov., 675; ¹⁶*Lancet*, 1931, ii, 582; ¹⁷*Klin. Woch.* 1931, x, 438; ¹⁸*Practitioner*, 1932, May, 531; ¹⁹*Brit. Med. Jour.* 1932, i, 332; ²⁰*Clinical Jour.* 1931, Oct., 493; ²¹*Surg. Gynecol. and Obst.* 1931, July, 45; ²²*Amer. Jour. Med. Sci.* 1932, June, 811; ²³*Lancet*, 1931, i, 71; ²⁴*Quart. Jour. Med.* 1932, April, 353; ²⁵*Arch. of Internal Med.* 1931, Sept., 470; ²⁶*Amer. Jour. Med. Sci.* 1931, Sept., 395; ²⁷*Ibid.* Aug., 281; ²⁸*Proc. Staff Meetings of Mayo Clinic*, 1932, March 9.

DIAPHRAGM, CONGENITAL ELEVATION OF.

W. H. Wynn, M.D., F.R.C.P.

W. B. Wood and F. G. Wood¹ discuss this condition and report 6 cases. Congenital elevation of the diaphragm is a condition due to faulty development, as the result of which the diaphragmatic dome on one side, usually the left, forms a sac bulging upwards into the thorax and containing displaced abdominal viscera. The condition was first recognized by Jean Louis Petit (1674-1750), who gave it the name of 'eventratio diaphragmatica'. The diaphragm is raised in many pathological conditions: (1) Certain abdominal conditions, e.g., ascites, pregnancy, subphrenic abscess; (2) Pulmonary diseases, e.g., tuberculosis, fibroid lung, atelectasis, neoplasm; (3) Paralysis of the phrenic nerve due to disease, trauma, or operation; (4) Temporary elevation of doubtful origin may occur in children or in adults as the result of trauma. In all these cases the cause of the rise of the diaphragm is obvious. It is characteristic of eventration that a considerable degree of elevation is present in the absence of any demonstrable cause. There is no increase in intra-abdominal pressure, there is no disease of the lungs, and no disease of the phrenic nerve. In congenital elevation the right side of the diaphragm is in its normal position, whilst the left forms a thin sac with normal attachments, but projecting into the thorax to reach a high level. This is due to a failure of the musculature on one side. As a result the muscle sheet is almost entirely replaced by a thin membrane, which yields to abdominal pressure.

The malformation is generally discovered by chance as the result of radiological examination or operation or on autopsy. There are no distinctive symptoms. The usual methods of inspection, palpation, etc., have only a limited value and may give misleading results, as the signs may suggest a pleural effusion. On inspection there may be diminished movement of the affected side, almost always the left. The presence of Litten's sign has been noted. Vocal fremitus is reduced. The results of percussion depend upon the relative amounts of fluid and air in the stomach, a dull note being elicited over the fluid, with a tympanitic note over the inflated part. Tympany may extend as high as the 4th rib. Breath-sounds and vocal resonance are absent over an area corresponding with the height of the diaphragm. A succussion splash is usually evident, for the stomach is rarely empty.

Radioecopy shows the diaphragmatic movement. During quiet respiration the unaffected dome exhibits normal excursions. These are usually well marked, but there is no evidence of exaggeration to compensate for the abnormality on the other side. When the patient is instructed to breathe deeply the abnormally elevated dome will be seen to move slightly up and down, its excursions being synchronous with those on the other side. A radiogram taken when the patient is recumbent shows the right side of the diaphragm in its normal situation, while the left side shows a boldly outlined and smoothly rounded dome, the summit of which may be at the level of the second or third intercostal space. No stomach bubble can be made out in this position, but the splenic flexure with its contained gas is seen lying high up under the raised diaphragm. The heart's shadow is displaced to the right, and just above it the translucency of the bifurcation of the trachea is similarly displaced. Below the affected diaphragm a uniform opacity obscures the view except in cases

where a displaced splenic flexure is found. In the erect position a very characteristic picture is obtained. Where previously an opacity was observed in the left lower zone a large gastric air-bubble is now revealed above which arches the bow line of the diaphragm. The contour of this line is unbroken in antero-posterior and lateral views, but an oblique view may show a bulge with convexity upwards, where the gastric fundus presses against the concavity of the yielding diaphragm. Below the translucent area, especially if the patient has recently had a good meal, can be seen two, or typically three, fluid levels in the stomach. In the erect lateral position the three fluid levels exhibit a staircase formation, the stairs ascending from left to right. After a barium meal the cardiac orifice appears to be low in position in relation to the rest of the stomach, and the fluid on entering the stomach appears to pass upwards towards the fundus and then downwards toward the pylorus. The whole of the stomach is more to the left than usual. The recumbent position is necessary to exclude a diaphragmatic hernia. In this position the smooth contours of the fundus are outlined and none of the barium is above the diaphragmatic level. In hernia some of the barium will pass into a pouch above the diaphragm. The three fluid levels are seen to be due to a curious folding of the wall causing three little pools of barium; an upper one near the œsophageal opening, a smaller one just in front of this, and a larger one more anteriorly placed, the walls of which seemed to be formed by the main body of the stomach. The lateral view thus presents the appearance of a cascade, with a stream of barium connecting the three pools.

TREATMENT.—No curative treatment is possible, but fortunately the condition seldom causes discomfort. Symptomatic treatment for any gastric disorders which may arise is indicated. For the rest the patient may be reassured that his abnormality is unlikely to lessen his efficiency or shorten his life.

REFERENCE.—*Lancet*, 1931, ii, 392.

DIAPHRAGMATIC HERNIA. (*See* HERNIA, DIAPHRAGMATIC.)

DIARRHŒA, CHRONIC.

Robert Hutchison, M.D., F.R.C.P.

CLASSIFICATION.—Chronic diarrhœa, as M. Erdheim¹ truly says, is a symptom and not a disease. He suggests the following classification as a convenient working basis in studying a given case:

CLASSIFICATION OF CHRONIC DIARRHŒAS.

I. *Functional*—

1. Gastrogenous.
2. Intestinal fermentation and putrefactive dyspepsias.
3. Nervous diarrhœa.
4. Endocrine:—
 - a. Basedow's disease and thyroid intoxication.
 - b. Addison's disease.
5. Toxic (uræmia).
6. Pancreatic (chylous diarrhœa).
7. Idiosyncratic or anaphylactic.

II. *Organic*—

1. Inflammatory:—
 - a. Bacterial: (i) Specific—(a) dysentery, (β) cholera, (γ) tuberculosis, (ii) Nonspecific—various colitides where no specific germ can be found.
 - b. Protozoan: (i) Amœbic, (ii) Syphilitic, (iii) Various other tropical diseases.
2. Tumours:—
 - a. Benign: (i) Lipoma, (ii) Polyposis.
 - b. Malignant: (i) Carcinoma, (ii) Sarcoma.
 - c. Inflammatory tumours (non-neoplastic): (i) Diverticulosis, (ii) Tuberculosis, (iii) Actinomycosis, (iv) Hodgkin's disease.
3. Mechanical causes—foreign bodies.

This classification seems too elaborate. Philip Brown² suggests the following provisional groups: (1) neurogenic, (2) reflex, (3) irritable bowel, (4) allergic, (5) diarrhœa following acute infection of unknown nature, (6) deficiency diarrhœa, (7) sprue-type, and (8) faulty fat digestion; but these certainly do not cover the whole field. McCræ states that the common causes of chronic diarrhœa are: (1) gastrogenous, (2) tuberculous enteritis, (3) pancreatic disease, (4) fatty or chylous diarrhœa with disease of the absorption system, and (5) emotional. To this grouping he adds mucous colitis, loose stools due to gastrocolic reflexes or carbohydrate indigestion, cœliac disease, sprue, and hill diarrhœa.

Perhaps the most practical classification is one based primarily on the part of the alimentary tract which is the source of the disorder:

1. Gastrogenous, due to mal-digestion in the stomach.
2. Fatty diarrhœa, due to imperfect digestion or absorption of fat. This includes pancreatic diarrhœa, congenital steatorrhœa, and diarrhœas of the cœliac type.
3. Enteritis, properly so called, a catarrh of the small intestine and including so-called 'fermentative' and 'putrefactive' diarrhœa.
4. Colonic diarrhœas, where the seat of the trouble is in the colon, e.g., chronic catarrhal colitis, ulcerative colitis, tuberculous and malignant disease, scybalous or spurious diarrhœa, etc.
5. Neurogenic, where the nerve mechanism is over-excitable. These may be subdivided into: (a) psychical, (b) reflex (lienteric).

DIAGNOSIS.—To arrive at a diagnosis it is necessary, in addition to the ordinary clinical investigation, to examine the rectum digitally and, if necessary, by the sigmoidoscope; to make a naked-eye inspection of the stools; and to examine them microscopically for the presence of parasites, of undigested connective-tissue or starch, etc., and perhaps to have them analysed for excess of fat; to give a test-meal; and to use the X rays after a barium enema.

Even when all these methods have been employed, however, one is often left in doubt as to the cause. Indeed, Philip Brown, in reviewing the records of the Mayo Clinic for a whole year, was forced to the conclusion that in two-thirds of the cases in which diarrhœa was the major complaint there was nothing definite to explain the condition. The cause of enteritis, for example, is, as P. Morawitz³ says, often quite unknown.

TREATMENT.—This must depend upon the cause. **Diet** is the most important measure, but dieting must not be overdone. In most cases a 'low-residue' diet is indicated, but special types demand a diet of special composition. Thus in the fatty diarrhœas fats should be restricted; in the fermentative, carbohydrates should be limited; in the putrefactive, animal proteins should be reduced.

Drugs are of limited use. In gastrogenous diarrhœa full doses of **Hydrochloric Acid** are indicated, and in enteritis the **Carbonate and Phosphate of Calcium** are helpful. The routine use of astringents is to be avoided. **Opium** is of value in small doses before meals in reflex (lienteric) diarrhœa and in other forms to relieve tenesmus or to ensure sleep. In the psychogenic diarrhœas there is a danger of the patient's acquiring a habit, and opium is best avoided; the **Bromides**, however, are free from objection and sometimes succeed.

As regards other measures, **Vaccines** are of uncertain value but may prove helpful in certain types of indeterminate diarrhœa (Philip Brown). Opinions differ as to the benefit derived from **Colon Irrigations**. Some authors condemn them, as a routine agent, out of hand; others (Morawitz) find them of use in chronic colitis.

REFERENCES.—¹*New Eng. Jour. Méd.* 1931, Aug. 5, 135; ²*Amer. Jour. Surg.* 1932, March, 483; ³*Münch. med. Woch.* 1931, July 31, 1287; Oct. 9, 1731.

DIPHTHERIA.*J. D. Rolleston, M.D., F.R.C.P.*

EPIDEMIOLOGY.—B. Weill-Hallé¹ compares the number of admissions and case-fatality of diphtheria at the Hôpital des Enfants Malades, Paris, in 1929 and 1930, with his observations at the same hospital in 1903. During the last twenty-five years there has been a considerable fall in the incidence of diphtheria in Paris, mainly as the result of active immunization; but the number of severe cases still remains high owing to the virulence of the organism, delay in the diagnosis and treatment, association with seasonal infections, a special constitution, and latent congenital syphilis. The dose of antitoxin now used at the hospital is three or four times as large as in 1903, and the subcutaneous route has been replaced by the intramuscular, with the result that the death-rate is lower than it was twenty-five years ago.

Similarly at Marseilles E. Cassoute² reports that there has been an increase in the incidence and severity of the disease, but that the case-fatality has not risen, owing to the doses of antitoxin having been considerably increased.

In a discussion on the recent outbreak of severe diphtheria in Germany, J. Husler, H. Schaber, and De Rudder³ pointed out that this malignancy was not peculiar to Germany but that similar epidemics had occurred in France, Italy, Hungary, and North America. The high fatality-rate was shown to be due to the predominance of malignant faucial cases, whereas laryngeal attacks of which there had been a high incidence in 1915 had considerably diminished in frequency. De Rudder did not consider that there were any grounds for the view that meteorological or constitutional factors were responsible for the malignancy of the outbreak, which he held was rather due to the high toxicity of the diphtheria bacillus.

The ninth annual summary by the *Journal of the American Medical Association*⁴ of diphtheria mortality in ninety-three cities of the United States with a population of 100,000 and over shows that in 1931 the highest mortality was in the cities of the three Southern groups, but it could not be decided whether this was due to an excessive prevalence of the disease in 1931 throughout the Southern cities, to an unusual freedom from or mildness of diphtheria in the Northern States, or to a more extensive active immunization in the latter group. The number of diphtheria deaths in the ninety-three cities and the death-rate for the total population concerned were both much lower than in any previous period, being less than half what they were in 1929 (see MEDICAL ANNUAL, 1931, p. 151). It was, however, impossible to say how far this decline in diphtheria mortality was due to natural fluctuation in the severity of the disease and how far to prophylactic inoculation and other methods of control.

BACTERIOLOGY.—P. Roberto⁵ examined the blood in 100 cases of diphtheria of various degrees of severity, and found *C. diphtheriae* in only 4 cases, of which one was fatal. The examination was repeated in 12, 24, 48, and 72 hours, and in only one instance was a positive result again obtained. The presence of *C. diphtheriae* in the blood is therefore a rare and transient phenomenon without any prognostic significance. It helps, however, to explain an unusual localization of the organism in diphtheria carriers, such as the urine or cerebrospinal fluid.

BLOOD.—P. Landowski⁶ examined the blood in 100 cases of diphtheria in children aged from 13 months to 14 years with the following results: (1) The amount of blood-urea is almost constantly increased in severe or malignant forms, and there is often a slight hyperazotæmia in moderate or mild attacks. (2) Hyperchloræmia is frequent in diphtheria, being barely appreciable in mild forms, but more considerable in severe attacks. (3) Hypcholesterinæmia is very frequent at the onset of diphtheria and at the height of the attack, but in convalescence there is a hypercholesterinæmia which precedes a return to

the normal condition. (4) Hypoglycæmia is the rule in malignant diphtheria, and is fairly frequent in mild attacks, so that it has no prognostic significance. (5) The number of red cells is usually little affected at the onset or during the height of the disease, but a fall occurs in convalescence. (6) The hæmoglobin value is more or less diminished at the height of the disease. (7) The number of leucocytes varies considerably in the course of diphtheria, but a leucocytosis exceeding 20,000 is always a grave sign. Polymorphonucleosis is the rule at the height of the disease, and eosinophilia appears in convalescence. (8) The bleeding time is little if at all affected in mild or moderately severe attacks, but in hæmorrhagic cases it is prolonged. The coagulation time is not affected. (9) The sedimentation rate is always accelerated at the onset and height of the disease. In almost all favourable cases the acceleration is considerable, while in malignant cases it is relatively moderate.

SYMPTOMS AND COMPLICATIONS.—A. G. Signy and R. D. Bruce⁷ report a case of *umbilical diphtheria* in a male infant admitted to hospital when 17 days old with the diagnosis of *erysipelas of the umbilicus*. Four of the eight other children in the family had recently been taken to hospital for *faucial diphtheria*. Birth had been quite normal. The cord had dropped off on the fourth day, but on the fourteenth the abdominal wall round the umbilicus looked red and raw. On admission to hospital a purulent exudate was seen oozing from the umbilicus, which lay at the base of a crater $\frac{1}{10}$ to $\frac{1}{8}$ in. in depth filled with a yellowish green slough. Stretching for $\frac{1}{2}$ in. around was a greyish-white area dotted with small red spots, and beyond this was a further ring of brawny red skin. The temperature rose to 100° on the day following admission, and then gradually became normal. The peri-umbilical inflammation spread for four days and then began to recede. The throat and nose were negative, but swabs from the umbilicus showed virulent diphtheria bacilli. Death took place on the twelfth day. Macroscopically all the organs were normal. Microscopically there was no abnormality of the heart muscle, but the adrenals showed intense congestion of the medulla.

The liability for cutaneous diphtheria to be mistaken for other skin conditions and prove refractory to all treatment until its true nature is recognized is illustrated by Friedmann,⁸ who records two cases of *diphtheritic blepharitis*. The patients were a child aged 2½ and a servant girl in whom the condition had been regarded as due to *scrofula*, and had lasted two months in the former and a year in the latter. After discovery of diphtheria bacilli and injection of antitoxin the blepharitis cleared up in eight days in the case of the child and in a fortnight in that of the servant.

G. Bismut⁹ states that the occurrence of *diphtheria following tonsillectomy* is by no means rare, and may be severe owing partly to the delay caused by the difficulty of diagnosis but mainly owing to the rapid and early absorption of toxins. It is therefore advisable that children should be actively immunized against diphtheria before they undergo removal of tonsils and adenoids.

C. Shoukhoff and L. M. Turan¹⁰ made *electrocardiographic studies* of 50 children aged from 5 to 14 years during the course of mild diphtheria, and found that, as in scarlet fever, electrocardiographic changes occurred in a high percentage of mild cases, and might be present in the absence of clinical signs of myocardial involvement. As in scarlet fever also the changes tended to persist, as is shown by the fact that 46 per cent of children with abnormalities in the ventricular portion of the electrocardiogram presented persistence of these signs up to the time of their discharge from hospital. Children, therefore, convalescent from diphtheria should not, in the writer's opinion, be pronounced out of danger until they have been examined by the electrocardiograph. S. Alstead¹¹ also made electrocardiographic studies on 100 cases of diphtheria, 23 of which

were mild, 32 moderate, and 45 severe, and came to the following conclusions: (1) The electrocardiograph is a valuable means of estimating the severity of diphtheritic myocarditis and is the only means of accurate diagnosis of conductive lesions in most cases. (2) Although a large proportion of cases of mild myocarditis are not detected by clinical methods, such cases are comparatively rare in moderate and severe diphtheria. The character of the heart sounds, therefore, is usually a sufficiently accurate guide to the state of the myocardium. (3) The most valuable physical signs in the heart as determined by simultaneous electrocardiographic records are (a) progressive softening of the first heart-sound at all areas, especially the mitral and aortic, (b) the character of the cardiac impulse at the apex, and the movement of the apex beat to a position farther away from the mid-line, and (c) splitting of the first mitral sound, producing a triple rhythm. (4) Serial electrocardiographic records show much more frequently than clinical records alone that the onset of diphtheritic paralysis is accompanied in a considerable proportion of the cases by a relapse in the condition of the heart. (5) The severity of the cardiac lesion is usually proportional to the severity of the toxæmia when the specific treatment is commenced. In some cases, however, neither the clinical nor the electrocardiographic changes are sufficient to explain the state of impending circulatory collapse which is often seen in diphtheria. (6) The gross degeneration of the myocardium and specialized conducting system frequently shown by the electrocardiograph during diphtheria is mostly transient. Complete heart block is by far the commonest lesion associated with fatal cardiac collapse, but is probably only a contributory factor in a condition characterized by widespread changes in the circulatory system.

W. E. B. Hall¹² reports a fatal case of *acute toxic encephalitis* in a female aged 18 months, who was suddenly taken ill with vomiting, increasing drowsiness, high temperature, and convulsions. The cerebrospinal fluid was under pressure, with a mainly mononuclear cell-count. Death took place on the second day of disease. In addition to membrane in the pharynx from which diphtheria bacilli were cultivated, the necropsy showed distension of the cerebral vessels, with linear hemorrhages throughout the white matter. The cerebellum, pons, medulla, and spinal cord were normal. Hall has been unable to find any other case of encephalitis in diphtheria on record besides that reported by Querido (see MEDICAL ANNUAL, 1929, p. 131).

DIAGNOSIS.—De Wayne G. Richey¹³ records seven cases of a condition closely resembling diphtheria in the form of pneumococcus pseudo-membranous pharyngitis. In all a typical pneumococcus was found to be the dominant micro-organism. Local symptoms were constant, consisting in severe sore throat, salivation, dysphagia, and cervical adenitis, while the systemic reaction varied considerably. A characteristic lesion was always found, consisting in a white adherent odourless sheet of fibrin on a superficially eroded oral mucous membrane. The condition as a rule is not dangerous, and attacks tend to recur. The disease resists most forms of local and general treatment, but striking results are obtained by topical application of **Ethylhydrocupreine Hydrochloride**.

PROPHYLAXIS.—G. Ramon and R. Debré¹⁴ in a discussion of the various modifications of immunization by **Anatoxin** state that millions of injections in different countries have proved that the reactions produced by it are perfectly harmless not only in the healthy person but also in the tuberculous subject. As many as 94 to 96 per cent of those injected acquire sufficient immunity within six weeks to two months to render a previously positive Schick reaction negative. The first injection should consist of $\frac{1}{2}$ c.c., followed three weeks later by a second injection of 1 c.c., and after an interval of two

or three weeks a third injection of 1.5 c.c. Modification of the method by spraying the anatoxin into the nostrils is not practical, economical, or certain in its action. The same may be said of attempts to produce immunity by the digestive tract by the administration of pills containing anatoxin. Löwenstein's method of inoculation with an ointment containing killed diphtheria bacilli and toxoid produces immunity in a much smaller proportion of cases than does the injection of anatoxin.

L. Landau¹⁵ points out that though three subcutaneous injections of anatoxin usually confer an immunity to diphtheria of long duration within six weeks' time, the method is not infallible. Diphtheria may sometimes develop in spite of inoculation, and probably more frequently than is supposed. The attack in such cases is usually mild, but occasionally it is severe.

F. A. B. Meerseman¹⁶ states that combined inoculation against diphtheria and enteric fever was carried out in a French regiment in which diphtheria had been more or less prevalent in an endemo-epidemic form for the last ten years. Schick-testing was first performed, and positive results were obtained in 53.01 per cent of soldiers who had come from towns and in 72.05 per cent of those from rural districts—a much higher proportion of positive results than that usually observed. Three injections were given, the first consisting of 1 c.c. of **T.A.B. Vaccine** and $\frac{1}{2}$ c.c. of diphtheria **Anatoxin**, the second of 1 c.c. of T.A.B. vaccine and 1 c.c. of anatoxin, and the third of $1\frac{1}{2}$ c.c. of anatoxin only. The interval between the first and second injections was eighteen days, and between the second and third fifteen days. The local and general reactions were usually slight. The proportion of negative Schick reactions following combined inoculation was as high as that found after anti-diphtherial inoculation only. After the inoculations had been carried out no further cases of diphtheria arose until after the arrival of a fresh batch of recruits who had not been inoculated.

TREATMENT.—E. C. Benn, E. Hughes, and S. Alstead¹⁷ record their observations on toxic diphtheria treated by the combined **Antitoxin and Dextrose-Insulin Therapy** recommended by Schwentker and Noel (*see MEDICAL ANNUAL*, 1931, p. 154). Comparison of 89 consecutive cases so treated with 131 controls showed that the case-mortality in the control group was 35.9 per cent as against 22.5 per cent in the dextrose-insulin group. In both groups the percentage of cases which recovered without paresis was approximately the same, but in the dextrose-insulin group a considerably higher proportion of cases recovered with paralysis as compared with the control group. The incidence of serum sickness was considerably less in the dextrose-insulin group (18.4 per cent) than in the controls (30 per cent).

W. T. Benson¹⁸ records his observations on 37 patients with moderate or severe laryngeal diphtheria in whom **Laryngoscopy and Aspiration** were performed. Suction was performed once in 30 cases, twice in six patients and three times in one child. Membrane was removed in 24 patients, in 7 others mucopurulent secretion only was aspirated, and in 6 nothing was obtained. Aspiration produced immediate relief in 10 patients, in another 10 the breathing became definitely easier after the removal of membrane or secretion, and in 17, three of whom had tracheo-bronchial diphtheria, no definite benefit resulted. Benson concludes that although at least five years' experience of aspiration treatment will be required before statistical evidence of the value of the method can be expected, the dramatic relief following suction in certain cases is worthy of serious consideration.

H. von Willebrand¹⁹ records 10 cases of laryngeal diphtheria which had been treated by suction in the fever hospital at Helsingfors since October, 1930. Lynah's method of bronchoscopy and direct inspection was not employed,

but a specially devised metal catheter flattened on the sides like an O'Dwyer tube was substituted. In 3 cases intubation was also performed, but the tube was left in only for a few hours. One child, aged 9 months, with bilateral bronchopneumonia on admission, died, but all the others made a complete recovery.

REFERENCES.—¹*Bull. Acad. de Méd.* 1931, cv, 471; ²*Marseille-méd.* 1931, 273; ³*Munch. med. Woch.* 1931, 1247; ⁴*Jour. Amer. Med. Assoc.* 1932, xcviii, 1644; ⁵*Gior. di Batteriol.* 1932, 274; ⁶*Thèse de Paris*, 1932, No. 35; ⁷*Arch. of Dis. Childh.* 1932, vii, 43; ⁸*Deut. med. Woch.* 1931, 1542; ⁹*Thèse de Paris*, 1931, No. 452; ¹⁰*Amer. Jour. Dis. Child.* 1931, xlii, 811; ¹¹*Quart. Jour. Med.* 1932, xxv, 277; ¹²*Canad. Med. Assoc. Jour.* 1932, xxvi, 566; ¹³*Jour. Amer. Med. Assoc.* 1932, xcviii, 730; ¹⁴*Presse méd.* 1932, 545; ¹⁵*Thèse de Paris*, 1932, No. 82; ¹⁶*Arch. de Méd. et. Pharm. mil.* 1932, 65; ¹⁷*Lancet*, 1932, i, 281; ¹⁸*Ibid.* 1931, ii, 956; ¹⁹*Acta Paediat.* 1932, xii, 191.

DISSEMINATED SCLEROSIS. *Macdonald Critchley, M.D., F.R.C.P.*

The continued interest in the clinical problems associated with disseminated sclerosis was evidenced by the discussions on etiology and symptomatology held at the Centenary Meeting of the British Medical Association. Although recent years have witnessed no striking advance in our knowledge either of the causation or of the cure of this malady, nevertheless there has been some crystallization of our ideas as regards its clinical aspects; interesting and suggestive data have accumulated as regards its relationship with other neurological affections.

At the Centenary Meeting, Adie's opening paper dealt lucidly with the questions of onset, the early manifestations, and the course and duration of the disease. Reference was made to certain uncommon symptoms and then special stress was laid upon retrobulbar optic neuritis as a symptom.

Age of Onset.—The common teaching is that the first symptom of disseminated sclerosis rarely appears after the age of 45. Thus, in Adie's series of 107 cases the age of onset fell in the third or fourth decade in almost 75 per cent, the earliest age being 12 years. F. R. Ferguson,¹ however, referred to the problem of disseminated sclerosis as encountered in the elderly. Two groups of cases are met with in practice: (1) Those in which the disease commences in early life and yet the patient lives on until 60 or 70; and (2) Those in which the disease starts in the late forties or fifties. There are a sufficient number of patients in the second group to constitute a real problem in diagnosis to anyone engaged in neurological practice. Statistics vary, but apparently no fewer than 20 to 25 per cent of patients complain of their first symptom after the age of 40. The author quoted a series of 743 cases of disseminated sclerosis from the National Hospital, Queen Square, of which no fewer than 92 (12 per cent) were over 50 and 10 were over 60 years of age at the time of their discharge. Ferguson demonstrated pathological evidence of disseminated sclerosis in two cases where the age of onset had been 55 and 56 respectively, and he quoted two cases, aged 76 and 67, where the disease had been present for over 40 years. One very important point emerged—namely, that there was no obvious clinical difference notable in the cases which started relatively late in life.

Retrobulbar Optic Neuritis.—Several speakers emphasized the importance of this symptom in disseminated sclerosis. Adie obtained unequivocal history of acute retrobulbar neuritis in 41 out of 118 cases of disseminated sclerosis. In every instance it was an early symptom and in 20 it was the first symptom; Adie believes that an attack of optic neuritis rarely appears after the disease is firmly established. Dealing with a series of 70 cases of acute retrobulbar neuritis, Adie found that in 31.3 per cent the patients were already suffering from disseminated sclerosis; in 41.8 per cent 'probably disseminated sclerosis'

was the diagnosis made; and in the remaining 26.8 per cent there were no other suspicious symptoms or definite organic signs of a neurological order. The statements were made that: (1) Disseminated sclerosis is the only known cause of acute unilateral retrobulbar neuritis; and (2) Apart from certain rare allied acute inflammatory diseases of the nervous system, it is the only cause. It must not be overlooked, however, that occasionally in disseminated sclerosis, instances of bilateral acute retrobulbar neuritis do occur. Thus, in C. P. Symonds' series of 171 cases of disseminated sclerosis, there were 8 patients in which the optic neuritis was bilateral. Earlier studies upon this particular symptom in disseminated sclerosis were quoted in the *MEDICAL ANNUAL*, 1932 (p. 471).

Trigeminal Neuralgia in Disseminated Sclerosis.—It is axiomatic that patients with disseminated sclerosis rarely suffer from severe or protracted pain; an exception must be made, however, in the case of the well-known association with trigeminal neuralgia. A small though not a negligible number of patients complain of severe paroxysmal pain situated in the territory of one or more of the divisions of the Vth nerve. Sometimes the pain is bilateral. The pain is usually not associated with objective sensory change, but exceptionally a blunting of tactile sensibility is found in the painful area.

The patient is often a little older than the average case of disseminated sclerosis. As a rule the neurological manifestations render the diagnosis easy. In the older type of patient, however, where the clinical signs may be those of a more or less pure spastic paraplegia, the diagnosis may be a matter of some difficulty.

Treatment by means of alcoholic injection, or resection of the sensory root of the Gasserian ganglion, is followed by cure, the case behaving in the same manner as one of uncomplicated trigeminal neuralgia.

Post-mortem investigation has been carried out on a few of these cases. Oppenheim described a plaque of sclerosis within the Gasserian ganglion; in this patient there had been an anaesthesia over the painful region of the face. In a series of patients examined by H. L. Parker³ no lesion was found in the ganglion. The cases all showed features typical of disseminated sclerosis, with perhaps a special preponderance of sclerotic areas in the pons. Parker speculated that the explanation of the trigeminal pain might lie in an exposure and consequent vulnerability of the root of the trigeminal nerves in the brain-stem, resulting from de-myelination of the surrounding white matter. In this way the nerve is perhaps rendered more susceptible to the influence of extrinsic morbid processes.

The 'Barber's-chair Phenomenon.'—Clinicians have interested themselves for the past decade in the not uncommon occurrence of a curious symptom in patients suffering from disseminated sclerosis. Typically, the patient experiences, when he flexes his head on to his chest, a sensation of tingling or pins and needles extending across the shoulders and down the two arms as far as the finger-tips. The dysaesthesia persists so long as the head remains bent, and ceases as soon as it returns to the normal position. At times hypertension of the head and neck will also evoke this sensation, and, very occasionally, lateral movements also. The sensation may also occur during flexion of the dorsal spine as well as the cervical. Although the distribution of the pain is usually as described, it may also include the whole of the vertebral column and even both legs as far as the heels. At times the dysaesthesia may be of painful intensity and suggest a sudden electric shock. This symptom incommodes the patient by appearing at frequent intervals during the day, as when dressing or doing the hair. Its name, indeed, derives from its occurrence during the

ritual of the barber's chair. Under the title of 'signe de décharge électrique' J. J. Lhermitte was probably the first to describe this symptom in connection with disseminated sclerosis, in collaboration with Bollak and M. Nicolas⁴ and later with G. Lévy and M. Nicolas.⁵ It has often been looked for and described within the past six or seven years, and other reports in the literature have appeared by W. J. Adie,⁶ Roger, Réboul-Lachaux, and Aymes,⁷ and C. S. Read.⁸

Although the barber's-chair phenomenon is most typically associated with disseminated sclerosis, it is not pathognomonic of that disease. Indeed, this sign has been noted during the War as appearing in cases of injury to the cervical spine, and we now know it as not rare in commotio spinalis cervicalis (Babinski and Dubois,⁹ Ribeton¹⁰), and in fractures of the atlas (G. Jefferson¹¹). It has also been described in cases of syphilitic meningo-myelitis, and the reviewer has known it also in syringomyelia and spondylose rhizomélisque.

The explanation is uncertain. Almost certainly the responsible factor must be a stimulus of purely mechanical character. We know from the work of R. W. Reid and C. S. Sherrington that flexor movements of the vertebral column, especially in a forward direction, produce a not inconsiderable diminution in the capacity of the vertebral canal. A pull on the nerve-roots may also be an important factor. Lhermitte and his colleague suggest an analogy with *Tinel's sign*, wherein mechanical traction, percussion, or compression of an injured peripheral nerve evokes similar electrical sensations. In cases of disseminated sclerosis and of spinal commotio, it is suggested that the barber's-chair phenomenon is produced by mechanical factors operating on an injured or diseased spinal cord, wherein the damaged myelin sheaths render the axis cylinders unduly vulnerable.

Pathogenesis.—Since the fiasco of the 'spherula insularis', attention has strayed to other claimants in the realm of pathogenesis. In particular, interest is being aroused in the work of R. Steiner, of Heidelberg, who for the past few years has been finding unusual histological appearances in the nervous tissue of cases of disseminated sclerosis which has been subjected to an elaborate staining technique. The claims are again those of a spirochete, and by his special method Steiner has demonstrated in 7 out of 28 cases of disseminated sclerosis a spirochete which differs from the *Sp. pallida* in being thicker and coarser. Moreover, in 26 of his 28 cases, Steiner found curious 'silver-cells'; similar bodies were also seen in brains from patients with G.P.I., but not once in a series of over 100 control cases. Helen J. Rogers¹² repeated these investigations in Vienna, employing Steiner's technique; out of 11 cases of disseminated sclerosis, an organism was found in one; 'silver-cells' were seen in all, and in many instances an argentophil debris was noticed which might, according to the author, represent spirochaetal fragments. Examination of the brain from a case of G.P.I. showed 'silver-cells', but four other control brains gave negative results.

Disseminated Sclerosis as a Form of Metatuberculosis. A novel suggestion as to the pathogenesis of disseminated sclerosis has recently been raised on the Continent. Working in Vienna, Löwenstein¹³ has claimed to have cultured tubercle bacilli from the blood in 42 per cent of cases of disseminated sclerosis, by means of a special technique. Clinical analogies between tuberculosis and disseminated sclerosis have been emphasized, such as the aggravation of both diseases by over-exertion and by pregnancy; and the improvement in both instances under rest and diet. M. Ahringsmann¹⁴ has extended the speculations still further and raises the question whether disseminated sclerosis may not bear to tubercle the same relationship as tubes and general paresis bear to syphilis. But more recent clinico-experimental studies carried out by

A. Friedmann, Katz, and L. Rabinowitsch¹⁵ have failed to discover the slightest justification for placing tuberculosis in any general or special association with disseminated sclerosis.

REFERENCES.—¹*Lancet*, 1932, ii, 396; ²*Ibid.* 1930, ii, 19; ³*Brain*, 1928, li, 46; ⁴*Rev. neurol.* 1924, ii, 56; ⁵*Presse méd.* 1927, May 14; ⁶*Brain*, 1927, 50, 724; ⁷*Rev. neurol.* 1927, i, 1036; ⁸*Jour. of Neurol. and Psychopathol.* 1932, Jan., 227; ⁹*Soc. de Neurol.* 1918, Jan. 10; ¹⁰*Thèse de Paris*, 1919; ¹¹*Brit. Med. Jour.* 1927, ii, 153; ¹²*Jour. of Neurol. and Psychopathol.* 1932, xiii, 50; ¹³*Münch. med. Woch.* 1931, 1080; ¹⁴*Ibid.* 1928, Nov. 13; ¹⁵*Zentralbl. f. d. g. Neur. u. Psych.* 1932, lxiv, 260.

DRIVER'S THIGH AND OTHER PRESSURE PARALYSES.

Macdonald Critchley, M.D., F.R.C.P.

J. Hoets¹ calls attention to the occurrence of fatigue or pain in the muscles of the right thigh among those who spend a considerable time in driving a car. The disability may amount to that of a typical sciatica. According to the author, the cause lies in a long-continued pressure on the sciatic nerve in the lower third of the thigh, by the sharp edge of the seat, as a result of pressure upon the accelerator pedal. The trouble is apt to occur when the springs of the seat have given way. Treatment comprises adjustment of the seat by doing away with the usual tilt backwards.

Cases have also been described of paralysis of the peroneal nerve from pressure, as from recumbency upon an operating-table; or from the squatting posture of coal-pickers. A case is on record of severe bilateral sciatica paralysis occurring in a man who dropped into a drunken sleep while sitting across the open mouth of a barrel, into which he gradually settled.

H. W. Walliman² has drawn attention to affections of the peroneal nerves in debilitated patients, from crossing the legs. Predisposing factors include some degree of peripheral arteriosclerosis; and loss of weight, depriving the nerve of some of its protective cushion of fat. In his series of 27 cases, it was found eight times as often in men as in women; it rarely appeared before the fourth and fifth decades of life, and was commonest in patients forced by illness into inactivity. In a later paper Walliman³ also reports cases of paralysis of the ulnar nerves, usually bilateral, in bedridden debilitated subjects. The author believes that compression of the nerve between the bone and the underlying surface is an important factor.

REFERENCES.—¹*Med. Jour. of Australia*, 1932, Feb. 20, 265; ²*Jour. Amer. Med. Assoc.* 1929, Aug. 31, 670; ³*Amer. Jour. Med. Sci.* 1930, April, 528.

DROWNING. (See RESUSCITATION FROM ASPHYXIA.)

DRUG ADDICTION. (See ALCOHOL AND DRUG ADDICTION.)

DUODENAL ULCER. (See also GASTRIC AND DUODENAL ULCER.)

Robert Hutchison, M.D., F.R.C.P.

In an Hunterian Lecture J. A. Ryle¹ has given a very full account of the 'natural history' of duodenal ulcer. The lecture contains nothing really new, but some of the author's opinions are worth quoting as being founded upon a wide experience.

Hæmorrhage and perforation, cicatricial stenosis, and anchorage of the ulcer-base to the head of the pancreas, are, he says, the chief complications, and to these must be added anastomosis ulcer following operation. Hæmorrhage occurs in about a quarter of the recognized cases. The older the patient, the longer the history, and the more severe the previous pain, the more dangerous is the hæmorrhage, for in these circumstances it is probable that the ulcer is deep and that a large vessel has been eroded. The author draws attention to an important, if rare, syndrome of pyloric stenosis in which general

symptoms predominate—so-called 'gastric uræmia'. The symptoms include drowsiness and irritability or stupor often leading to coma, and are believed to be due to alkalosis. The blood-urea is often markedly raised. Vomiting need not be severe. This complication adds greatly to the risk of operation, and every case of pyloric stenosis should therefore have a blood-urea estimation done before an anæsthetic is given. Treatment with alkalis, of course, is contra-indicated in the presence of this complication.

As regards anastomotic ulcer, Ryle's experience suggests that the chief predisposing factors are faulty selection of cases for operation and the presence of a strong constitutional predisposition to ulcer. Short-circuits in young subjects and in cases with a short history are unsound. Hæmorrhage is not in itself an indication for operation, as many patients bleed again after it. His present policy is to advise operation in cases of pyloric stenosis and in long-standing cases of ulcer in which there is a tendency to gross scarring, anchorage, or slow transit of food through the stomach, and in which there has been recurrence in spite of one or more strict courses of medical treatment; in cases with erosion of the pancreas; and in cases with coexisting duodenal ileus. He opposes surgical treatment in young patients, in non-obstructive cases with short histories and adverse pedigrees or which have not had a course of strict medical treatment; in cases of recent hæmorrhage lacking other indications; and in cases showing gastric 'hurry'. Highly nervous and elderly individuals may also often have to be deemed unsuitable for surgical treatment. Economic and environmental factors must often, Ryle admits, modify the above indications.

Sara M. Jordan and E. D. Kiefer² have tried to determine the factors which influence prognosis in the medical treatment of ulcer on the basis of a study of cases treated at the Lahey Clinic, Boston. They found that about half of the cases showed recurrence within five years. About one-fifth of these are due to the patient's carelessness. Of the remainder about one-fourth are characterized by gross hæmorrhage not associated with pain. If there is a history of two or more hæmorrhages or a marked intolerance to alkalis, medical treatment is not likely to be successful. On the other hand, the age at the onset of symptoms, the duration of the disease, the severity of the pain, and the amount of deformity of the 'cap' are of little prognostic value. Improvement in the X-ray appearance of the cap is the most reliable single objective test of the value of treatment. Alkalosis was found in a large proportion of cases to be associated with hypertension, nephritis, or obstruction in the urinary tract.

REFERENCES.—¹*Lancet*, 1932, i, 327; ²*Amer. Jour. Surg.* 1932, March, 472.

DYSENTERY, AMOEBIC. (*See* AMOEBIASIS.)

DYSENTERY, BACILLARY. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

The seasonal variations of dysentery bacteriophages have been studied in Calcutta by C. L. Pasricha, A. J. de Monte, and S. K. Gupta.¹ They found that they were met with most frequently, both in man and in the natural waters, during the height of the dysentery season in the early monsoon months of July and August. They were isolated in 24 per cent of 85 waters examined during a year, but they decrease in the later monsoon months, apparently owing to dilution of the waters by the heavy rainfall. They were also found in 30 per cent of 403 individuals examined. In both cases the virulence of the bacteriophages isolated was usually low, and none attained to maximum activity, but a few developed great activity after repeated transfers on susceptible strains of bacteria.

REFERENCE.—¹*Ind. Med. Gaz.*, 1931, Oct., 546.

DYSPEPSIA, INTESTINAL.*Robert Hutchison M.D., F.R.C.P.*

This subject was considered in the ANNUAL of 1932 (p. 145). F. Cramer¹ makes the interesting suggestion that the chief factor in the production of the flatulent form is not abnormal fermentation, but stagnation in the abdominal vessels, which he speaks of as 'abdominal plethora', which leads to defective absorption of gas from the bowel. He attributes the plethora to sedentary habits and over-eating, and advises in treatment not only a restricted and unfermentable diet but a more active life, abdominal massage, and breathing exercises. Drastic aperients should be avoided.

REFERENCE.—¹*Münch. med. Woch.* 1932, Feb. 12, 256.

EAR, AFFECTIONS OF. (*See also OTITIS MEDIA IN INFANCY.*)*F. W. Watkyn-Thomas, F.R.C.S.***RECENT WORK ON HEARING.**

The experiments of E. G. Wever and C. W. Bray,¹ quite apart from their value in the physiological problems of hearing, are likely to have important practical results, as by their methods it will be possible to study the exact part played by each element in the mechanism of hearing. The work is based on the principle that every nerve impulse produces a change of potential in the nerve-trunk. The auditory nerve of an animal is exposed under general anaesthesia, and a pair of electrodes are put on the nerve and the neck muscles. The electrodes are connected to an amplifier and then to a loud-speaker in another room. Words and sounds of tuning-forks from 128 d.v. to about 5000 d.v. which enter the ear can be distinctly heard from the loud-speaker. W. Hughson and S. J. Crowe² have used this method to investigate the changes of hearing caused by various injuries, and have already recorded the following observations. Cats were used for all experiments.

1. Clearness and resonance of sounds are diminished by any changes in the length or diameter of the external auditory meatus, or by amputation of the pinna.

2. Incision or destruction of the tympanic membrane, so long as there is no interference with the ossicles or their ligaments, has little effect on the transmission of sounds.

3. Anything which increases the rigidity of the ossicular chain, any interference with the head of the malleus, or division of an ossicular joint, impairs the conduction of sounds, particularly of the low notes.

4. Division of the tensor tympani, which causes a slackening of the ossicular chain, produces a considerable loss in transmission of high tones.

5. Puncture of the round window causes great loss in the transmission of all tones.

6. A slight increase of pressure on the membrane of the round window increases the transmission of all sounds, provided that the foot-piece of the stapes is intact.

7. Blocking the niche of the round window with plaster-of-Paris has no effect on the transmission of sound unless the pressure on the membrane is raised.

[Experiment 2 is a complete answer to patients who believe that 'cutting the drum' in an otitis media 'will make them deaf'. Experiment 4, as Dundas-Grant points out, suggests a hitherto unsuspected cause of nerve deafness. Experiment 6 explains how a small plug of greased wool used as 'an artificial drum' after a radical mastoid operation often gives better results when placed over the round window than it does when applied to the oval window, as the

classical teaching advises. Lastly the experiments as a whole suggest that the function of the round window is to act as a 'safety-valve' for the inner ear.—F. W. W.-T.]

INJURIES OF THE EAR.

K. Wittmaack³ offers a new explanation for *deafness following injuries which do not cause any visible damage to the middle ear or skull*. He has long held that the nerve-endings of the cochlear and vestibular nerves are not free in the endolymph but are held by a fine network in a jelly-like mass. Thus there are really two fluid systems in the membranous labyrinth, and a sudden commotion—e.g., a violent blow on the ear driving in the stapes—will squeeze the end-organ mass and perhaps destroy the end-organ. The arrangement is such, according to Wittmaack, that the endings in the cochlea and the sacculæ are more likely to be damaged than those in the rest of the labyrinth.

[This view has been criticized; but if true, it is of the greatest practical importance, especially in medico-legal work. There is a tendency to regard with suspicion any history of deafness following an accident in a case where there is no evidence of any injury to the membrane or skull and no sign of vestibular disturbance such as giddiness or failure to respond to the labyrinth tests, although it is recognized that such a condition can occur. If Wittmaack is right, it is clear that total deafness might easily be produced without any disturbance of equilibrium.—F. W. W.-T.]

W. Grete⁴ describes a *temporo-sphenoidal abscess as a late complication of fractured base* six months after the injury. The fracture was a longitudinal split of the temporal bone. The patient recovered. This is a rare complication; meningitis is more usual, especially in transverse fractures which open the labyrinth. Grete believes that all cases in which a skull injury is followed by persistent middle-ear suppuration should be kept under close observation in case some intracranial complication should arise. Any sign of aggravation of the condition should be regarded as an indication for an immediate mastoid operation with exposure of the dura underlying the fractured bone. If these rules are obeyed, he does not think it necessary to follow the practice of Voss, who operates on all cases of fractured base in which the fracture opens the middle ear.

DISEASES OF THE EXTERNAL AUDITORY MEATUS.

H. W. Barber⁵ points out that most of the cases described as '*eczema of the external auditory meatus*' are really cases of *infective meatitis*. Eczema is the reaction of the skin to irritation or infection, and the essential feature is an oedema of the malpighian layer. The cells of this layer are the site of antibody formation and thus they become 'sensitized' to the specific irritant. In the external meatus they become sensitized to various organisms, of which the most common is the pityrosporon, which is the usual cause of seborrhæic eczema of the scalp. In seborrhæic dermatitis the *Staphylococcus albus* is always found in active growth, but the furuncles which occur in the meatus in this condition are usually due to the *Staph. aureus*, to which the meatal skin may become secondarily sensitized. The *Streptococcus longus* also infects the skin, but, unlike the staphylococcus, attacks the natural folds rather than the pilosebaceous follicles.

As the resistance to the organisms is offered by the skin, vaccines should be administered by intradermal, not subcutaneous, injection. The phenomenon of skin sensitization explains the fact, often noticed clinically, that various local remedies which at first give relief, after a time make the condition worse;

the skin becomes 'sensitized' and every application causes a reaction. This seems specially the case with mercurial preparations and sulphur.

Undoubtedly the commonest cause of an acute exacerbation of meatitis is mechanical irritation by the patient, who attempts to remove debris or alleviate irritation with a match or a hair-pin.

Thus in any case of infective meatitis we should : (1) Look for and, if found, treat any seborrhœic condition of the scalp. (2) Discover the predominant organism and administer, intradermally, the appropriate **Vaccine**. (The writer points out that most streptococcal infections of the skin, become secondarily infected with *Staph. aureus*, so that special culture media are needed to detect the streptococcus in the mixture.) (3) Be on our guard against skin reaction to the ointments, etc., we apply locally. (4) Warn the patient against scratching and rubbing.

True eczema of the meatus is either : (1) Allergic, associated with paroxysmal rhinitis, migraine, and asthma—found in infancy, adolescence, and young adult life ; or (2) The variety that used to be called 'gouty' eczema, associated with arteriosclerosis and sometimes with albuminuria.

BATHING AND AURAL DISEASE.

J. E. G. McGibbon⁶ analyses the history of 17 cases of acute or subacute ear conditions attributed to bathing, all seen by him in one year. One patient had an acute otitis externa with impacted cerumen. All the others had acute otitis media. Of these 16 patients, 7 had suffered from previous middle-ear disease, and the other 9 all had some existing abnormality of the upper respiratory tract. Although in Liverpool, where all these cases were seen, the percentage of bathers who use the baths is far greater than those who use the sea, the proportion who suffered from ear disease was greater among sea-bathers. From these facts McGibbon believes that acute aural infection following bathing is usually an autogenous infection, and is rarely caused by infection derived from the water. He advises, therefore, that anyone intending to bathe should be examined by his doctor as to ears, nose, and throat, and this should be remembered during the routine examination of school children. Anyone who suffers from any abnormality of the ears, nose, or pharynx should be warned of the danger of bathing.

MIDDLE-EAR AND MASTOID DISEASE.

Treatment of Middle-ear Discharge.—E. Watson-Williams⁷ points out that in uncomplicated otorrhœa the essentials of treatment are free escape for the discharge and scrupulous cleanliness. 'Drops' cannot reach organisms hidden in the folds of mucous membrane, and **Peroxide of Hydrogen** is useless as a disinfectant in the presence of thick mucopus, and is so irritating that it may be dangerous. **Magnesium Sulphate** is non-irritant and mildly bactericidal, but its most valuable action is to cause free exudation of serum by osmosis and so to flush out the ear. For these reasons Watson-Williams recommends the use of magnesium sulphate in all cases of painless otorrhœa, especially for the viscid mucous discharge often found in childhood. The ear is carefully dried with pencils of cotton-wool, the meatus is then filled with powdered desiccated magnesium sulphate, and a piece of wool put in the *entrance* of the meatus, not into the meatus itself. The treatment may have to be repeated twice or thrice daily. Such treatment, of course, cannot succeed in the presence of untreated tonsillar or nasal sepsis, and is not likely to be of use when there is a chronic, frankly purulent discharge, as this usually indicates the presence of mastoiditis with bœic disease.

Two recent papers dealing with *ionization of the ear* are of particular interest. M. Landry⁸ carried out a series of experiments on rabbits to discover whether ions could be made to pass through the intact tympanic membrane into the middle ear. The substance used was magnesium chloride, and Landry's results lead him to believe that: (1) Magnesium in excess is 'fixed' in the petrous by the method; and (2) The elimination of magnesium from the body is retarded by the ionization. The results were obtained by quantitative estimation of the magnesium in the temporal bones and excreta of the experimental animals and checked against similar analyses done on normal animals used as controls. Unfortunately the magnesium content of normal bone is variable, and magnesium is not the usual therapeutic agent in ionization. D. M. Lierle and R. A. Sage,⁹ experimenting with zinc, examined the ionized tissue by X rays, qualitative chemical methods, and the spectroscope, and found no evidence of impregnation. As a result of their experiments they conclude that the possibility of the deposition of metallic zinc in the living tissue is remote and open to question. In view of these findings, the value of Landry's research appears doubtful.

Otitis Media in Sucklings.—(The full reports of all the papers read at the B.M.A. Meeting in 1932 are not available at the time of writing.)

The relation between otitis media in infancy and gastro-intestinal disturbances such as 'summer diarrhoea' has long been a subject of controversy. Three views are held: (1) That the otitis media is a cause of gastro-intestinal disturbance, i.e., the ear is a septic focus. (2) That otitis media is secondary to the gastro-intestinal infection, and is caused by it. (3) That otitis media is not more common in infants with gastro-enteritis than in other infants, and that the two conditions are independent.

M. Krassnig¹⁰ examined the ears of 920 infants admitted for non-aural diseases, mostly gastro-intestinal, and examined the temporal bones of 52 who died. In these 52 cases he found 5 cases of meningitis and 3 of sinus thrombosis, but as it had been previously found that post mortem 80 per cent of infants had a purulent exudate in the tympanic cavities, he does not think it possible to say whether in these 8 cases the meningitis or sinus thrombosis was due to the otitis condition or to general infection. In cases where he incised the membranes there was a slight exudate which quickly dried up, and the course of the illness was unaltered in any way. He regards this form of otitis as clinically unimportant; it is an expression of the lowering of resistance by the intestinal infection, and heals if and when the child recovers from the gastro-intestinal condition.

W. M. Mollison¹¹ classifies otitis media in infants as: (1) 'Obvious' otitis media, with symptoms pointing to the ear: this does not differ from otitis media in older children. (2) 'Latent' otitis media with no symptom in the ear: (a) 'real'—discovered in infants apparently normal; (b) 'pseudo'—associated with (i) general illness, crying, pyrexia; (ii) diarrhoea and vomiting ('parenteral'). (3) Tuberculous otitis media.

1. 'OBVIOUS' OTITIS MEDIA.—This does not differ from otitis media in older children. The first sign may be meningismus, and the case may be diagnosed as tuberculous meningitis if the membranes are not examined. Examination may be difficult and an electric auriscope is useful. Bulging of the membrane in infants is not an absolute sign, as in many children a normal membrane bulges during crying. Treatment follows the usual lines—incision of the membrane and mastoid antrotomy when the symptoms indicate the need. The operation should be done as rapidly as possible in order to avoid long anaesthesia. This is particularly important when otitis occurs in pneumococcal conditions.

2. 'LATENT' OTITIS MEDIA.

a. 'Real'.—In some of these cases the infection is probably blood-borne to the mastoid, and the tympanic cavity is infected secondarily. Such infections may be pneumococcal. A mastoid operation is then required.

b. 'Parenteral'.—This condition Mollison accepts as a latent otitis media, the enteritis being a reaction to the infection.

3. TUBERCULOUS OTITIS MEDIA.—Mollison does not regard this as common in infants; when it is diagnosed an adequate mastoid operation should be done, which gives a very good prospect of recovery.

Mastoid Operations.—E. F. Ziegelman¹² describes a method of lining the mastoid cavity which he has found very satisfactory. This is a modification of one described some years ago by D. Campbell Smyth.

(1) The usual postaural incision is made, down to but not into the periosteum. (2) The soft meatus is divided at the junction of the cartilaginous and membranous parts. (3) The dermo-periosteal layer of the deep meatus is incised along, and as close as possible to, the tympanic ring. This is done with a little right-angled knife passed into the meatus from behind. (4) From the upper and lower ends of this incision, incisions are carried out along the posterior bony meatal wall, on to the mastoid and then backwards fanwise. (5) The flap with the meatal portion is then dissected up and turned back. The flap so formed is a truncated triangle; the blunt 'apex' is covered with the modified skin of the meatal wall. (6) The radical operation is completed and the flap turned forward to line the cavity. A skin-graft is applied to the periosteal surface and kept in place with an ambrine inlay. (7) A plastic operation on the meatus is then done. The method is not advised if the dura or sinus wall is exposed, or if there is any labyrinth lesion.

O. Voss¹³ points out that in dealing with the spread of middle-ear suppuration we are too apt to think of the mastoid as the only path of infection. Although this is undoubtedly the usual route, the infections that spread along the anterior group of cavities are just as dangerous, especially in highly cellular bones. This group of cavities includes the cells in the roof of the middle ear above the Eustachian tube (from which infection may reach the cells around the labyrinth and carotid canal, and from them the petrous pyramid), the attic region, and the zygomatic cells. Deep extension in this region gives the Gradenigo syndrome with trigeminal neuralgia and VIth nerve palsy, or signs of labyrinth irritation. Also, infection of the anterior group of cells can cause meningeal infection, septicaemia, and pyaemic metastatic abscesses without obvious infection of the venous sinuses; this complication is probably due to septic thrombosis of small veins which traverse the tegmen tympani.

These conditions cannot be relieved by a simple mastoid operation, and even a radical operation, which sacrifices the structures of the middle ear, and sometimes sacrifices them unnecessarily, does not always expose the whole infection area.

Voss therefore advises the operation of **Epitympanal Antrotomy** in the following cases: (1) Chronic attic suppuration; (2) Uncomplicated subacute suppuration of the middle ear affecting the attic, or of the attic alone; (3) Acute infection of the cells of the petrous pyramid; (4) Pyaemia secondary to attic suppuration; (5) Fracture of the temporal bone crossing the epitympanic cavity; (6) Cases with labyrinthine or meningeal symptoms occurring in the course of an acute otitis media.

In carrying out the operation Voss brings the incision over the root of the zygoma, and after opening up the mastoid antrum and accessory cells he removes the zygomatic ridge above the meatus and clears the bone from above downwards and inwards until the attic is fully opened and the heads of the

malleus and incus are exposed. For this stage he prefers fine nibbling forceps to gouges. If possible a ridge of bone should be left to support the tympanic membrane. He makes no attempt to enlarge the meatus by a plastic operation, but packs the wound and does a secondary suture later.

[It will be seen that Voss accepts wider indications for this operation, which closely resembles the 'epitympano-mastoid' operation as used in this country, than has been customary. This is specially to be noted in cases with labyrinthine or meningeal symptoms. In fracture of the temporal bone he has always taken a more radical view than is usually accepted here.—F. W. W.-T.]

H. Beyer¹⁴ reminds us that the epitympano-mastoid operation 'is no more difficult in children than in adults, and L. Graham Brown¹⁵ advises it for most cases of chronic suppuration where the greater part of the tympanic membrane is intact, and where the perforation, usually marginal, is situated in the superior or posterior parts of the membrane or in the attic region. He does not make any plastic flap, but attempts to preserve the soft parts of the meatus intact and keeps the meatus firmly packed. This method closely resembles the 'Plastiklose' operation of Bárány, and it must be remembered that the late results of Bárány's operation are not always satisfactory. S. H. Mygind¹⁶ in his Clinic in a period of eight years found that of 31 cases of mastoid operations which relapsed and required further operation, 22 were cases in which Bárány's operation had been performed. J. Jessen¹⁷ found that in 71 cases of Bárány's operation there was complete healing in only 58 per cent of cases.

[It seems therefore that, valuable though the epitympanal operation is, there are many cases for which the radical operation is the only adequate treatment; but this does not justify us in resorting to it if a more conservative method offers any reasonable chance of success.—F. W. W.-T.]

DEAFNESS : CAUSES AND TREATMENT.

A. A. Gray,¹⁸ in his most recent work, has made sections of the auditory nerves of a series of subjects who in life suffered from *otosclerosis*. In these sections he found a degeneration of the cochlear nerve, which appeared first in the medullary sheath and neurilemma and later in the axis-cylinder. This degeneration occurs independently of changes in the labyrinth capsule or fixation of the stapes. In Gray's opinion deafness occurs as the result of cochlear nerve degeneration before the stapes is fixed, and the clinical picture of otosclerosis is produced principally by the nerve degeneration, stapedial fixation playing a minor part. Further, the diminished secretion of wax, the sluggish vasomotor reaction, the diminished sensibility of the drumhead, the bony changes in the labyrinth, and the degeneration of the cochlear nerve are independent of each other and are all produced by some common factor, probably changes in the nervous controlling mechanism of the nutrient blood supply.

Although the number of specimens examined is too small for wide generalizations, the constancy of the findings supports the probability of the 'degenerative' view, and warns us to regard with considerable caution the claims of 'cure' in otosclerosis.

M. Sourdille¹⁹ summarizes the results of four and a half years' practice of his operation for otosclerosis. The principle of his operation is that, owing to obstruction of the fenestra ovalis by fixation of the stapes, the perilymph cannot move and so the sound waves cannot be propagated to the endolymph. The remedy for this would be to make an artificial fenestra.

It certainly is a clinical fact very hard to explain on the view of Gray, mentioned above, that many observers (Passow, Bárány, Holmgren, and Jenkins) found a considerable temporary improvement when such a fenestra

was made. Unfortunately improvement was only temporary, and it was believed by all these workers that the regression of hearing was due to closure of the artificial fenestra by new bone. In order to avoid this, Sourdille closes the fenestra by a flap of the tympanic membrane and skin of the posterior meatal wall, which gives a thin, flexible covering and does not contain any bone-forming elements. The operation is done in two or three stages and comprises: (1) An epitympano-mastoid operation with formation of a plastic flap from the posterior meatal wall and tympanic membrane; (2) Separation of the operated area from the attic; (3) Resection of the head of the malleus; (4) Fenestration of the external canal as near to the ossicles as possible, so that the vibrations can be transmitted through the ossicles to the flap; (5) Immediate closure of the fenestra by the flap. In 16 cases operated on by this method, 12 have shown considerable improvement, and in 3 of the 12 the improvement has lasted over two years.

Encouraging though these results are, it is still too early to build much on them. The operation is technically very difficult, the indications are narrow, and it is possible, from the clinical description, that the cases were of the class described by Lowndes Yates²⁰ as 'membranous periotic deafness' where the lesion is inflammatory in origin and is not a true otosclerosis.

S. H. Mygind,²¹ in a paper on *non-suppurative diseases of the sound-conducting apparatus*, elaborates the views on Ménière's disease described in the 1932 MEDICAL ANNUAL (p. 152). Briefly, he believes that the conditions described as 'chronic middle-ear catarrh', 'exudative' and 'dry catarrh', 'chronic adhesive processes', etc., are, like Ménière's syndrome, due to an oedematous thickening of the lining membrane caused by intracellular 'water-logging' of the subepithelial connective tissue. The ear condition may thus be secondary to various general conditions such as heart and kidney diseases, intoxications either endogenous or exogenous, and, especially, vasomotor abnormalities. In the later stages there will be fibrous-tissue formation, with, eventually, degeneration and atrophy of the auditory nerve endings. Thus the treatment of these conditions should include careful examination of the general state of the patient, with a determined effort to reduce the water content by diuretics and restriction of fluid. Thacker Neville²² reports a case where a patient who drank ten pints of fluid a day and, although he had no vertigo, was deaf to the shouting voice, was able to hear the conversational voice after a week's fluid limitation.

The work done in the last two years by the National Institute for the Deaf on the *correction of hearing defects* is summarized in a short report.²³ It is stated that "The vast majority of all patients who are deaf can be made to hear accurately and well by means of properly prescribed hearing aids."

In their cases the patients' hearing has been measured by the audiometer, and the degree of deafness found has been used as the basis on which to prescribe the appropriate hearing aid. A great deal of attention has been paid to perfecting a mechanism by which the *sounds of speech* rather than pure notes can be magnified. There seems to be a hope of a considerable advance in the perfection of hearing aids by the work that is being done on the combination of hard and soft carbon diaphragms. This may overcome the greatest difficulty in the use of aids, which, as is admitted in the report, is the discomfort suffered by patients with nerve deafness when they use any electrical instrument. If this could be done a very great advance would be achieved.

The usefulness of the **Zünd-Burguet Electrophonoïde Method** is still under discussion, and the complete disagreement on the subject is shown by two papers. M. Yearsley²⁴ describes his results in a series of 200 cases treated in

the last seven years. He claims nearly 80 per cent of successes and 8 per cent of partial successes. On the other hand R. Graham Brown,²⁵ in a detailed analysis of 40 consecutive cases, found "the benefits were very few and slight." In several cases where the patients believed that the hearing had improved he found no evidence by the tests of any improvement at all. In a few cases there did seem to be some relief from tinnitus. Graham Brown believes that better results are obtained by such orthodox methods of treatment as maintaining the patency of the Eustachian tubes, administration of sodium arsenate and iodine, endocrine medication, etc.

THE INTERNAL EAR.

Labyrinthitis.—A. Logan Turner and J. S. Fraser²⁶ conclude their work on labyrinthitis as studied in their clinic over a period of twenty-five years. In 14,479 cases of middle-ear suppuration, acute and chronic, they had 216 cases of labyrinthine complications (1.5 per cent), and this figure, although it includes 22 cases of labyrinthitis following radical mastoid operations, probably does not represent the real total, as in the early years of the investigation the methods of diagnosis were not complete. In 144 cases of 'spontaneous' labyrinthine disease admitted without intracranial complications there were only 4 deaths; in 22 cases of 'induced' labyrinthitis following radical mastoid operations there were 8 deaths; in 50 cases admitted with intracranial complications there were 37 deaths. From these figures it may be safely deduced that: (1) Labyrinthitis is more common than is generally believed; (2) Labyrinthitis when treated is an eminently curable condition; and (3) Although it is generally admitted that labyrinthitis is capable of spontaneous cure, it is not safe to trust to this. In the 216 cases there were 19 with labyrinths that had undergone spontaneous cure and 50 with intracranial complications where the labyrinth had not been treated.

Another point of interest is that there were only 3 cases of cerebellar abscess in the series. This is important, because many surgeons have stated that labyrinthitis is the most common cause of cerebellar abscess. Meningitis as a complication was not regarded as hopeless if promptly treated by trans-labyrinthine drainage. In fact, meningitis following labyrinthitis has a far better prognosis than that following lateral sinus thrombosis. D. McKenzie²⁷ showed a case where meningitis following labyrinthine suppuration had been cured by labyrinth drainage alone, without opening the internal meatus. E. Watson-Williams²⁸ describes four such cases, in none of which the internal meatus was opened after labyrinthectomy, and all recovered.

This shows that meningitis of labyrinth origin is a curable condition, but probably it would be 'playing for safety' in such cases to complete the labyrinth operation by opening the internal auditory meatus.

Vertigo.—G. Portmann²⁹ contributes an interesting paper on *affections of the auditory nerve in encephalitis lethargica*. He points out that the disease attacks the cochlea and vestibular branches, but the vestibular more frequently. The vertigo produced varies in form and severity. The most common kind is a 'rocking-horse' sensation, a feeling of swinging up and down without any sensation of turning. Occasionally the vertigo may be prostrating and last for several weeks. On the whole disturbances of equilibrium are more common than true vertigo. Portmann sums up the symptoms as: (1) A permanent *hypo-excitability*, often associated with anomalous labyrinth reactions; (2) Variable and slight *hyperexcitability*. The pathological lesion is a glial change in the nuclei and along the course of the nerve. It is probable that the 'epidemic vertigo of Gerlier' spoken of in the text-books was really an outbreak of encephalitis lethargica.

LATERAL SINUS THROMBOSIS.

In spite of all improvements in methods of diagnosis the average death-rate, taken from large groups of figures, is still too high, and in current literature there has been considerable discussion as to the best operative technique.

Douglas Guthrie and Stewart Middleton,³⁰ dealing with lateral sinus thrombosis in children, say that in childhood the condition is rare, but is probably more fatal than in adults (over 50 per cent mortality rate). They point out that the difficulty of diagnosis increases during an influenza epidemic, as the general symptoms may correspond with those of certain kinds of influenza. In children rigors may not occur, but the 'alpine-peak' temperature is always found.

In all but one of the cases reported the jugular was tied, but the authors believe that extension upwards is more common than downwards, and so they advise exposure and obliteration of the sinus well above the infected area. In one case after ligation of the jugular a massive œdema of the face, eyelids, and scalp appeared on the *opposite* side and lasted for ten days, after which it gradually disappeared. There was no chemosis or protrusion of the eyeball, so the condition cannot have been due to any disturbance in the cavernous sinus.

In the metastatic infections in the course of a lateral sinus thrombosis the hip seems to be the most frequently infected joint. The synovitis may be 'quiet' like that occurring in osteomyelitis.

In the acute stages **Blood Transfusion** was found to be of little value; but if the patient survives some weeks small repeated transfusions are useful to combat secondary anæmia.

O. M. Rott³¹ doubts the use of ligating the jugular vein in sinus thrombosis. He does not believe that ligation cuts short the septicæmia, as it blocks the chief avenue only and does not cut off the collaterals. He believes that ligature of the vein gets more credit for cures than it deserves; that it should be reserved for cases in which there is a definite focus in the vein itself, and that in such cases the vein should be resected. [It may be pointed out that in this country the usual teaching is that one collateral at any rate should be excluded. Ligation is usually made above the common facial, and, if this is impossible, the common facial is tied and divided.—F. W. W.-T.]

J. B. Potts,³² in an instructive paper, summarizes the results of 63 operations done in the last twenty-three years: 9 patients died, 2 of brain abscess, 4 of meningitis, 1 of pneumonia, and 2 of 'multiple abscesses' (pyæmia). Complications in this series seem to have been due to extensions from the region of the bulb. The principal points in treatment have been free and early exposure and 'open' treatment of the wound. A valuable suggestion for the treatment of doubtful cases where the infection appears to be limited to the sinus wall is temporary occlusion by packing above the infected area.

G. Portmann³³ advises active measures in all cases where the general symptoms suggest infection of the blood-stream during a mastoiditis. In all such cases, unless there is some other obvious source of infection, even if the wall of the sinus appears to be healthy, he advises incision and obliteration of the sinus with ligation of the jugular, and with resection if the wall of the jugular is infected. If the sinus is completely blocked by organized thrombus and there are no signs of general infection, he does not interfere with it.

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ECTOPIA TESTIS. (See TESTIS.)

ELECTROCARDIOGRAPHY. (See ARRHYTHMIA AND ELECTROCARDIOGRAPHY.)

EMBOLISM, PULMONARY. (See PULMONARY EMBOLISM.)

EMPHYEMA. (See also PLEURISY.) A. Tudor Edwards, M.Ch., F.R.C.S.

Acute Emphyema.—The increasing tendency recently is to replace major operative procedures for acute emphyema by more limited measures. The aspiration treatment of the streptococcal effusions during the acute phase of the underlying lung infection, or owing to the fact that no adhesions had formed, has been practised for many years. In the majority of cases the preliminary aspiration was followed by rib resection and drainage. The tendency nowadays, however, is to use aspiration treatment or treatment by insertion of intercostal tubes as complete surgical measures required for these cases. There is no doubt that if this type of treatment is carried out indiscriminately it will result in numbers of cases of gross residual pleural thickening with late secondary bronchiectasis, or in recrudescence of infection in incompletely obliterated emphyema cavities.

R. Boller¹ advises the **Aspiration Treatment** associated with **Irrigation** of acute emphyemas apparently independent of the type of organism and of the fluid aspirated from the chest. In this manner he has treated 5 cases of severe emphyema, of which 1 patient was lost. The number of aspirations apparently varies, as in the first case five aspirations were needed and in the second eight. An oily iodine solution similar to lipiodol is used for injection after aspiration.

W. Whittemore² condemns what he calls medical aspiration, and is in favour of either **Open Operation** or **Closed Intercostal Drainage**. The latter method should be used in his opinion: (1) In all desperately sick cases, regardless of the organisms present, and whether the pus is thick or thin; (2) In streptococcal cases; (3) When the pus is very thin; and (4) When tuberculous effusions have become secondarily infected. Rib resection should be performed where thick pus is obtained by aspiration, in encapsulated emphyema, and in those cases in which it is advisable to aspirate a number of times until thick pus has been obtained preceding operation.

C. Hedblom³ states that the fundamental treatment is **Drainage**, and that this should be instituted early by any method that will not embarrass respiration and circulation, and is to be maintained until the cavity is obliterated. Closed intercostal drainage is, therefore, the choice of all early acute cases, in all severe cases, and in infants. This treatment should be associated with **Irrigation**. In many cases rib resection may be required later and is essential where bronchial fistulæ are present. A similar treatment is advised by R. Bettman.⁴

There is a somewhat natural tendency to associate rib resection with open drainage, but the fact that a small portion of rib is removed does not necessarily

imply that the empyema cavity is open to the air. Various devices have been suggested to overcome this disadvantage of large-tube drainage, and quite a number are simple and successful. However, there is no doubt that in infants, in seriously ill patients, and in those with thin turbid effusions, especially the streptococcal type, either aspiration or intercostal air-tight drainage should be instituted as a preliminary measure. It is generally agreed that mortality depends upon the age of the patient, the highest being in extremes of age; upon the condition of the underlying lung, especially as regards the activity of the infective processes; upon the infecting organisms, it being generally accepted that those resulting from Group I pneumococcus are more favourable than those of other pneumococcal groups or than those due to other organisms such as the streptococcus; and, lastly, upon septic complications in other parts, such as secondary pericarditis or peritonitis, etc.

Chronic Empyema.—All writers on chronic empyema are agreed that it is a condition that is much more easily prevented than cured, and that the condition generally results from either delayed diagnosis of the acute condition or inadequate treatment. Effective treatment depends upon efficient exploration of the cavity, the establishment of drainage, and regular irrigation associated with the maintenance of negative pressure within the chronic empyema cavity. Exercises, particularly directed to encourage adequate movements of the diaphragm and the lower intercostal muscles, should be initiated early. It is also advisable in every case to eliminate the possibility of the condition being due to such chronic infections as tuberculosis and actinomycosis, by removal of a portion of the thickened pleura for histological examination. Treatment on these lines for the simple chronic cases should be carried out until the size of the cavity is no longer diminishing. It is only when this stage is reached that plastic operations upon the chest wall should be contemplated.

J. R. Head³ has drawn attention to a condition not uncommonly misdiagnosed, being classed as bronchiectasis or chronic pulmonary abscess—namely, chronic empyema with bronchial fistula. Four cases are described, and the symptoms are shown to resemble the afore-mentioned diseases, the chronic the former and the acute the latter. Diagnosis depends upon X-ray examinations in several positions, before and after lipiodol. Diagnostic aspiration is dangerous unless it can be determined that the parietal pleura is thickened.

REFERENCES.—¹*Wien. klin. Woch.* 1932, June 10, 761; ²*New Eng. Jour. Med.* 1931, Oct. 22, 791; ³*Jour. Amer. Med. Assoc.* 1931, Dec. 16, 1943; ⁴*Surg. Gynecol. and Obst.* 1932, Jan., 39; ⁵*Ibid.* 1931, Nov., 691.

John Fraser, Ch.M., F.R.C.S.Ed.

In the past year two papers have been the subject of review. Both deal with empyema from the general point of view, but a matter of interest is that both authors agree that treatment by repeated aspiration is not in itself a reliable method of treatment—that, in other words, some type of open and continuous drainage becomes imperative. M. Cohen,¹ basing his opinion on a study of 123 cases, states that the **Open Method of Drainage**, preceded by **Repeated Aspiration**, is the ideal method of treatment. For the very sick child and for infants he prefers the intercostal incision; in all other cases rib resection is done. Local infiltration with novocain is the anaesthesia of choice.

G. B. Packard,² recounting his experience in 64 cases, comes to very similar conclusions. He says, "If cure is not apparent after two or three aspirations, time and probably risk are lessened by establishing better drainage." Packard expresses a preference for one of the methods of **Closed Drainage**. Both authors are agreed that the mortality in infants will continue high, no matter what variety of treatment is pursued.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1932, April, 696; ²*Ibid.* 1931, August, 255.

ENCEPHALITIS, EPIDEMIC.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—Considerable attention has recently been given by different writers to the possibility of epidemic encephalitis being the cause of various *psychoses*. D. M. Van der Scheer,¹ for example, urges that in confusional states in particular the likelihood of acute encephalitis or an exacerbation of chronic encephalitis should be considered. A very careful inquiry should be made into the past history in such cases. Although it is not always possible to obtain a history of an acute onset or of an attack of 'influenza' or period of lethargy, before making a diagnosis of encephalitis, a history of disturbance of sleep, obstinate insomnia, or inversion of sleep rhythm is very significant, as is also a history of transient diplopia. In post-encephalitic psychoses lumbar puncture is of value for obstinate insomnia in addition to being an aid in diagnosis by a positive gold-sol reaction.

J. G. Rottenburg² records four examples of patients aged from 26 to 28 years showing that epidemic encephalitis may give rise to simple dementia or the hebephrenocatatonic form of dementia praecox.

J. Volstein³ reports six cases in patients aged from 2.1 to 2.7 years in whom an hallucinatory syndrome followed epidemic encephalitis after an interval of from seven to eleven years. The peculiar features of this syndrome when associated with epidemic encephalitis are the sudden onset, the absence of real delusions, the impulsive character, and the aggressive reactions.

F. Dials⁴ records thirty-three cases in patients aged from 12 to 62 of *amyotrophies* following epidemic neuraxitis. In some instances the amyotrophies are limited to some group of muscles, while in others they spread progressively to all the muscles of the body. The local muscular atrophies may sometimes be primary, i.e., without any previous paralysis, while others follow flaccid paralysis. Some of these paralyses are due to polyneuritis or radiculitis, as is shown by clinical and histological examination, while in others the atrophy appears to be of spinal origin, whether it be primary or secondary to flaccid paralysis. The muscular atrophy may assume a progressive course, closely resembling that of amyotrophic lateral sclerosis, death taking place as in that disease from glosso-labio-laryngeal paralysis. In other cases remission, complete arrest, or even regression of the atrophy may ensue.

PROGNOSIS.—A. J. Hall⁵ points out that though the prognosis of chronic encephalitis as a whole is very dark, there are many Parkinsonians whose lives at least seven years after infection are comparatively little interfered with by their disability. Out of 325 of his cases of Parkinsonism more than half are able to go about, look after themselves, and lead more or less ordinary lives.

TREATMENT.—The Second Report of the Matheson Commission⁶ shows that there still exists a wide divergence of opinion with regard to treatment, and that a large number of remedies, proprietary preparations, and methods continue to be used without successful results. In view of their extensive experience most importance must be attached to the work of Stern and Economo. Stern regards intramuscular injection of **Convalescent Serum** as the best remedy in the acute stage, and recommends **Atropine** or other preparations of belladonna such as **Scopolamine**, or **Sodium Cacodylate**, in the chronic stage. Economo advocates intravenous injection of iodine in the form of **Pregl's Solution** as the method of choice in acute cases, combined with subcutaneous, intramuscular, or intravenous injection of **Vaccineurin** and **Urotropine** by mouth or intravenously at the same time. He employs the same remedies in the chronic stage, in which he also recommends **Sodium Cacodylate** in large doses intravenously.

REFERENCES.—¹Nederl. Tijds. v. Geneesk. 1932, 2087; ²Thèse de Paris, 1932, No. 51; ³Ibid. No. 227; ⁴Ibid. No. 207; ⁵Brit. Med. Jour. 1931, ii, 833; ⁶Epid. Enceph. Second Rep. Matheson Comm. 1932, 28.

ENCEPHALITIS, POST-VACCINAL. (See VACCINATION.)

ENTERIC FEVER. (See PARATYPHOID FEVERS; TYPHOID FEVER.)

EPIDIDYIMIS, SURGERY OF. (See TESTIS, EPIDIDYIMIS, AND SCROTUM, SURGERY OF.)

ERYSIPELAS. (See also SKIN, STREPTOCOCCAL INFECTIONS OF.)

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—S. Nussbaum¹ records a case of *erysipelas gangranosa*, which differs from the usual type of erysipelas in the diffuse margin of the rash, the large deep ulcers in the skin formed in the path of the rash, the low blood-count, and in the α type of streptococcus being the causative agent instead of the β type. There are only two other cases on record, reported by Hoesch and Schilling respectively, which both occurred in adults. Nussbaum's case was in a girl, aged 11 years, in whom the infection gained entry through cracks of ringworm between the toes. The onset was sudden with high fever and a diffuse rash extending from the toes of the right foot to the groin. Extensive ulcers developed in the right foot and leg. *Streptococcus viridans* was grown from the lesions. Blood cultures were negative. The red corpuscles ranged from 2,000,000 to 3,000,000, and the leucocytes from 5200 to 7200. Recovery took place after fifteen days.

R. Soto-Iribarren² reports two examples of the rare condition of *erysipelas of the breast* during lactation in women aged 25 and 36 respectively. The first patient developed the disease on the fourteenth and the second on the twenty-second day after childbirth. In both cases the constitutional disturbance was severe, death taking place in one case on the eighth day, while the other recovered after an illness of three months.

TREATMENT.—S. Zanetti³ treated 40 cases of severe facial erysipelas in patients aged from 16 to 66 by intramuscular injections of **Colloidal Electric Rhodium**.* The drug proved painless, caused little or no local reaction, was not toxic, and did not give rise to any symptom of intolerance, even when it was continued for a considerable time.

REFERENCES.—¹Arch. of Pediat. 1932, 17; ²Thèse de Paris, 1932, No. 380; ³Rinascenza med. 1932, 32.

Sir W. I. de C. Wheeler, F.R.C.S.I.

J. M. Davidson¹ discusses the treatment of erysipelas by the early employment of **Ultra-violet Radiation**. The source of the ultra-violet light used in a series of cases was a standard model air-cooled quartz lamp. The efficiency of the lamp was tested by estimating the erythema dose with the arc at a fixed distance of 12 in. from the skin surface. In practically all the cases an exposure of two and a half to three minutes produced a mild but definite erythema. Two and a half to three minutes was assumed to be the universal erythema dose except in the case of infants. For actual treatment one and a half times to twice the erythema dose was employed. In other words, all cases except infants were exposed for five minutes with the arc at a fixed distance of 12 in. All the inflamed area was included in the exposure, with a margin of about 1½ in. of healthy skin when this was possible. There was often a brisk reaction, but after forty-eight hours the œdema had generally subsided, and the affected skin became dry and wrinkled. By this time also there was a critical fall in temperature in 31 of the 39 cases mentioned.

Davidson concludes an interesting paper with the following remarks: If the operator takes the trouble to estimate at regular intervals the efficiency of the

lamp used, the erythema dose for the individual is easily and quickly ascertained, and even when this is not done, but the dose gauged from previous experience with the lamp in use, there is a wide margin of safety. He summarizes as follows: (1) A report is presented on 51 cases of erysipelas treated by exposure to an artificial source of ultra-violet light, the exposure being one and a half times to twice that required to produce a definite erythema on normal skin. (2) The treatment of erysipelas, particularly the early case, by ultra-violet light appeared to give better results than other methods in use. (3) The method is easily applied, usually available, devoid of danger, cleanly, and inexpensive. (4) The technique is simple, and can be carried out with any ultra-violet lamp of known efficiency.

REFERENCE.—¹*Brit. Med. Jour.* 1932, i, 929.

ERYTHEMA NODOSUM.

J. D. Rolleston, M.D., F.R.C.P.

The occasional appearance of erythema nodosum in epidemic form has long been known and has been brought forward as one of the arguments for ranking it among the acute infectious diseases, as was done by Lendon, of Adelaide, who in 1905 renamed it 'nodal fever'. That such outbreaks are sometimes though not invariably associated with tuberculosis is shown by W. R. F. Collis,¹ who recently published several series of cases. The first consisted of 5 cases of erythema nodosum intimately associated with tuberculosis, in 3 of which tubercle bacilli had been found in the stomach wash-out. The second series consisted of 3 cases of erythema nodosum which followed streptococcal sore throat. The patients in this series gave strongly positive skin reactions to streptococcal endotoxin but were all negative to tuberculin. In a third series consisting of 6 cases of erythema nodosum, 4 seemed to belong to the tuberculous and 2 to the streptococcal type. Finally Collis describes a case of suspected tuberculosis in a girl, age 11 years, in whom subcutaneous injection of 0.005 c.c. of old tuberculin caused the appearance of an eruption indistinguishable from erythema nodosum on the legs, accompanied by a febrile reaction of thirteen days' duration. A second similar injection a month later produced a similar eruption, but without a febrile reaction. Collis concludes that erythema nodosum is a type of hyperactive tissue response to different bacterial allergens, and that the allergens responsible for erythema nodosum in London are commonly tuberculin and haemolytic streptococcal endotoxin.

An outbreak of 4 cases of erythema nodosum in a class of 31 girls, aged from 11 to 12, 29 of whom (93.6 per cent) gave a positive reaction to tuberculin, is described by A. Landau.² This high percentage is explained by the fact that one of the children in spite of an excellent general condition showed a cavity in the right lung and tubercle bacilli in the sputum.

Another small outbreak of erythema nodosum associated with tuberculosis is reported by N. D. Begg.³ The cases, 4 in number, occurred in a ward containing 12 children convalescent from whooping-cough. The ages of the patients ranged from 18 months to 5 years. In each case the Mantoux reaction was strongly positive and X-ray examination of the chest showed a slight increase in the root shadows suggesting some degree of hilar gland infection. In favour of the theory of specific infection was the fact that the cases appeared at an interval of seven to ten days, suggesting a case-to-case infection with a short incubation period. The spacing, however, might also be explained by varying times of exposure to tuberculous infection, as eight days before the first case of erythema nodosum occurred a child had died in the same ward of acute miliary tuberculosis.

ETIOLOGY.—V. H. Moon and A. Strauss⁴ have recently cultivated an

organism for which they propose the term *Corynebacterium cutis nodosæ* from the subcutaneous lesions of three cases of erythema nodosum and from the blood of one of these cases which was of unusual severity and ended fatally. Twelve rabbits and 3 guinea-pigs were inoculated intravenously with fresh cultures of the organism, and in 13 animals lesions with the histological features of erythema nodosum were produced. The same organism was recovered in cultures from these lesions. Similar organisms were found in sections from lesions in human beings and from the lesions of the inoculated animals. These observations thus confirm the view that erythema nodosum is a specific infection.

REFERENCES.—¹*Quart. Jour. Med.* 1932, N.S. 1, 141; ²*Arch. of Dis. Childh.* 1932, vii. 77; ³*Brit. Jour. Child. Dis.* 1932, 193; ⁴*Arch. Dermatol. and Syph.* 1932, xxvi, 78.

ERYTHROMELALGIA.

A. G. Gibson, M.D., F.R.C.P.

G. E. Brown¹ has made a study of 12 cases of erythromelalgia, in 9 of which the disturbance was bilateral and in 3 unilateral. The characteristics of this affection were described by Weir-Mitchell in 1872 and are: (1) Attacks of burning pain in hands or feet; (2) Pain initiated or aggravated by standing, exercise, or exposure to heat; (3) Relief on elevation of the limb or exposure to cold; (4) Flushing, congestion, and local heat of the affected part during the attack. The disease is difficult to treat. Those cases must be separated in which the cause is some other condition such as polycythæmia vera, peripheral neuritis, gout, and peripheral and general arteriosclerosis. Erythromelalgia can be distinguished relatively easily by determining whether the subjective symptom of burning is associated with increase of heat; this is so in erythromelalgia, in which during an attack the affected parts are found to reach or exceed a temperature of 34° C., but not so in Raynaud's disease. This determines the presence or absence of local vasal dilatation which is always a characteristic of erythromelalgia. Treatment of these conditions is still unsatisfactory, but the author recommends the application of Radium locally.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1932, April, 468.

EXOPHTHALMIC GOITRE. (See THYROID GLAND, DISEASES OF.)

EYE AFFECTIONS. (See CATARACT; CORNEA, DISEASES OF; EYE, CHEMICAL INJURIES OF; GLAUCOMA; IRITIS AND IRIDOCYCLITIS; RETINA, DETACHMENT OF.)

EYE, CHEMICAL INJURIES OF. W. S. Duke-Elder, M.D., F.R.C.S.

In the 1932 MEDICAL ANNUAL (p. 171) a survey was given of injuries to the eye by foreign bodies; in this volume it is proposed to complete the subject by a review of our knowledge of the pathology and treatment of chemical burns of the eyeball. Technically, a chemical burn is a change in the body tissues produced by the entrance of a chemical substance, and the nature and extent of the change depends upon many factors, such as the reaction of the chemical upon the tissues, the strength of the chemical, the quantity reaching the eye, and the time during which it remained in contact with it. Since the action of many chemicals is rapid and their penetrating power great, the damage caused by them is frequently extremely serious and mutilating; and despite the paucity of cases reported in the literature (Teräskeli in 1927 could only collect 24 records), such accidents are by no means uncommon.

The three most common chemicals involved in ocular accidents are acids, lime, and ammonia.

Acid burns are met with industrially and in the (fortunately) somewhat rare assault of 'vitriol throwing'. Their action is to coagulate the proteins of the cornea and conjunctiva, leaving a dense scar resulting in a complete opacity. Fortunately their penetrating power is not great and the entire damage is completed in a few seconds, for the dense surface coagulum stops penetration into the deeper tissues. Experimenting on rabbits' eyes Yoshimoto found that the order in degree of severity was—hydrochloric acid, sulphuric acid, nitric acid: burns with the first two in normal concentration led to phthisis bulbi, but the same result was reached with solutions of one-third the normal concentration of nitric acid.

Lime burns are most commonly obtained by splashing the eye when mixing cement. The corneal opacity formed is due to a combination of the lime with the cornea forming calcium albuminate and calcium carbonate, more especially the latter. As time goes on the albuminate is converted into the carbonate by the CO_2 of the cornea and the air, with the result that the opacity tends to increase and become encrusted over.

Of all burns those caused by *ammonia* are the most serious, largely because the damage is not only immediate but a chemical reaction persists for some days, making the prognosis always doubtful and usually serious. Immediately liquid ammonia is splashed into the eye, there occurs an intense edema of the lids, a chemosis of the conjunctiva, and a cloudiness of the cornea. It appears that the ammonia, acting as a strong base, combines with the proteins of the corneal tissues, forming a soluble alkali albuminate which possesses marked toxic properties, penetrates deeply into the tissues, and causes a slowly advancing and remorseless necrosis, breaking down and disintegrating the structure of the cornea until it slowly melts away. For the first few days, or even the first week, things may look well, and a good prognosis may be hoped for and predicted; but only after the first week has elapsed does the reaction become fully apparent— a hypopyon forms in the anterior chamber, a violent iritis ensues, the pupil contracts and adheres to the lens, a complicated cataract develops, panophthalmitis sets in, and the eye is lost.

A case recorded by Thies last year illustrates the insidiousness of this chemical destruction and the caution which should be exercised in giving a prognosis. In this case most of the immediately destroyed tissues were replaced by an oral mucous-membrane graft, and the eye seemed to do well for seven weeks. Even at this late date, however, the inevitable relapse occurred. It may be taken that in a severe burn by ammonia gas the eye is invariably lost; this is the usual result with liquid ammonia, and even the usual household spirits of ammonia (a 10 per cent solution) can cause destruction of the globe. It is known that in the living rabbit ammonia diffuses through the cornea and can be identified in the anterior chamber seven minutes after its entrance into the conjunctival sac; moreover, solutions as dilute as 1 in 10,000 used experimentally produce cataract. The essential factor is that the coagulative action of acids which tends to limit the extent of the damage is absent, while in its place occurs a spreading and penetrating necrosis.

TREATMENT.—The treatment of chemical burns of the eyeball is difficult and almost invariably disappointing. The safest procedure to adopt is **Copious Irrigations**, and again copious irrigations, with saline or water, to remove mechanically any excess of the chemical material. As may be realized, the most important factor is the time element, and irrigation should be started at the earliest possible moment. Any attempt to neutralize the chemical usually does more damage than good—it never is of any therapeutic value, a clinical observation which has been corroborated by experimental work on

animals by Cosgrave and Hubbard, who observed the effects of burns produced by sulphuric acid, nitric acid, phenol, sodium hydroxide, and ammonium hydroxide on the eyes of rats and rabbits. Apart from irrigations, little can be done. There is some disagreement as to whether atropine should be given or not for fear of the development of secondary glaucoma; on most occasions it should be given. Some writers advocate an early puncture of the anterior chamber to get rid of any ammonia which is present in the aqueous humour (Thies and others); while Cross recommends the instillation of **Glycerite of Tannic Acid** in burns due to ammonia and alkali—this may help to stop the prolonged chemical reaction. Other writers (Seefelder, for example) consider an ammonia burn hopeless from the start. Others recommend early and extensive **Grafting** from the oral mucosa. This is strongly advocated by Denig (1927), who suggested operation at the soonest possible moment after the ammonia burn. Thies (1928), on the other hand, would put off surgical intervention until the fifth day, while Rötth (1929) confines it to those cases when the greater part of the conjunctiva has sloughed away or the cornea has lost its epithelium and is insensitive.

In the case of lime burns some considerable alleviation of the corneal opacities may be obtained by the frequent instillation of neutral **Ammonium Tartrate**, commencing with 4 per cent solutions and increasing the strength to 10 per cent. The application of this chemical is not without pain, and the eye should be cocaineized first.

With regard to the ultimate treatment, the greatest problem is presented by the development of *sympblepharon*. This is a condition exceedingly difficult to combat, and the various suggestions of forestalling it, such as frequent movements of the lids (Cobat, 1929), or stitching the lids away from the globe on to the forehead and cheek (Hurst, 1924), are rarely of much value. Probably the best procedure to adopt after irrigation of the eye is to instil into the conjunctival sac a plentiful supply of a bland sterile ointment and apply a bandage. If adhesions form they should be destroyed by the cautery or diathermy or excised as completely as possible, and a wide grafting operation be undertaken at a later date when healing is complete.

BIBLIOGRAPHY. Cobat, *Arch. d'Ophthalmol.* 1929, xli, 416. Cosgrove and Hubbard, *Ann. of Surg.* 1928, lxxxvii, 89. Denig, *Arch. f. Ophthalmol.* 1927, exviii, 729. Hoffmann, *Arch. f. Augenheilk.* 1922, xci, 300. Rötth, *Klin. Monats. f. Augenheilk.* 1929, lxxxii, 669. Thies, *Arch. f. Augenheilk.* 1928, xcix, 188; *Klin. Monats. f. Augenheilk.* 1927, lxxix, 354; 1929, lxxxii, 353; *Arch. f. Ophthalmol.* 1928, cxx, 689; 1929, cxliii, 165. Yoshimoto, *Arch. f. Augenheilk.* 1928, xcix, 188.

FACE, NOSE, AND LIPS, STAPHYLOCOCCAL INFECTIONS OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

I. I. Koslin¹ discusses primary staphylococcus infections of the nose, lips, and face. He mentions 18 cases of septic conditions about the face. A large number of these were between the ages of 40 and 50; 6 died. He emphasizes that the preponderance of facial-vein involvement, with the typical blood-stream infection, metastatic abscesses, and meningeal complications, speaks for the spreading of the infection primarily through the lumen of the venous networks.

All surgeons are aware of the dangers of sepsis, especially about the lips. The reviewer² has reported four fatal cases. The infection owes its seriousness, *inter alia*, to the anatomical fact that there is an anastomosis between the superior ophthalmic vein and the facial, at its origin at the root of the nose. Thrombophlebitis extends into the cavernous sinus by this route. Thrombophlebitis follows furuncles of the lip more frequently than elsewhere. There is a rich venous plexus in the lip. The products of septic infections extend from this plexus into the collecting venous trunks, which in turn flow into the

facial vein. The treatment which the reviewer has employed is: (1) Intra-muscular injections of **Collosoi Manganese**; (2) Local application of 20 to 40 per cent hot solutions of **Magnesium Sulphate** or other hygroscopic solution in the form of stupes; (3) No local incision should be made until the septic focus is well walled off by granulation tissue and showing signs on the surface of spontaneous opening. The ligation of the facial vein recommended by some authorities is seldom a practical proposition and should be abandoned.

REFERENCES.—¹*Ann. of Surg.* 1931, July, 7; ²*Irish Jour. Med. Sci.* 1926, Aug.

FACIAL PARALYSIS.

Sir W. I. de Wheeler, F.R.C.S.I.

P. Pickerill¹ recommends the treatment of this condition by temporal and masseter **Muscle Grafts**. The advantages claimed are: (1) That the face as a whole is stabilized, having two tonic muscles at least on the paralysed side to oppose those on the normal side; and (2) That the patient is given the power of closing the eye on the paralysed side. This eliminates the serious risk of corneal ulceration. Pickerill recommends that the grafting should be undertaken in two stages, the first for the temporal muscle, and the second for the masseter, at an interval of some weeks. He has noticed in successful cases that the voluntary contraction definitely spreads from the grafted muscle to the paralysed muscle, and sometimes to other muscles.

Sir Charles Ballance and Arthur Ducl² give a complete account of the surgery of facial palsy.

REFERENCES.—¹*Med. Jour. of Australia*, 1932, March 26, 433; ²*Arch. of Otolaryngol.* 1932, Jan., 1.

FACIAL SPASM, CLONIC.

Geoffrey Jefferson, M.S., F.R.C.S.

A paper by Wilfred Harris and Dickson Wright¹ deals with the treatment of clonic facial spasm, a unilateral affection of a severity that varies from case to case. The muscular twitchings about the eye may be extremely disabling, making it difficult to follow employment through the constant closure of the eye, and in most cases the twitching affects the mouth as well, and indeed the whole facial musculature, in a unilateral distribution. The authors point out that in pronounced cases it is always possible to demonstrate some actual weakness of the 7th nerve, and they mention the possibility of these twitchings following a Bell's palsy. They consider that it is due to a chronic lesion of the lower facial neuron and that it is not of central origin, a point on which they are, in the reviewer's view, unquestionably correct. The spasms are often not painful, but cause annoyance to women for social reasons, besides interfering with vocational life. Harris has used **Alcohol** injection with a certain amount of success, and no doubt it has a place as a diagnostic procedure. The technique of the injection has been described, the alcohol being placed by punctures at the posterior edge of the mandible into either the upper or lower division of the facial nerve. But in order to obtain a permanent cure more drastic measures are necessary, and rather than inflict a lasting facial palsy they suggest, and have performed, the immediate **Suture of the Divided Nerve to the Central End of the Hypoglossal**. The precise technique employed is well described by Wright, and the cases operated on appear to have given satisfactory results.

REFERENCE.—¹*Lancet*, 1932, i, 657.

FILARIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—In two important papers F. W. O'Connor with C. R. Hulse^{1,2} record striking evidence regarding the extensive presence of adult filarial parasites, either healthy or degenerating, in the lymphatic tissues of persons

showing symptoms due to filarial infection, and consider that the obstructive phenomena of the disease can be readily explained in the absence of any secondary bacterial infection. They have studied minutely by serial sections the pathological changes in five lymphatic glands removed with their periglandular tissue, and in the first paper these are illustrated by twenty plates of microphotographs. In three of the cases a total of 21 adult filariae were demonstrated in a very small amount of tissue in addition to fragments of degenerated worms, so probably at least 26 to 30 were present. They are nearly all found in the afferent lymphatics, their branches in the capsule, or the cortical sinuses, but very rarely in the medulla. Few male or calcified worms were met with. After the removal of the infected glands embryo filariae could still be found in the patient's blood, so other adult worms remained in the system, and there is thus clear evidence of hyperfilaria. Many of the female worms were evidently alive at the time of their removal, and O'Connor lays stress on the fact that the condition of development of embryos in the uterine tubes of each of the worms found in a case were in an identical stage in accordance with Lane's hypothesis of cyclical parturition. The tissues showing well-staining worms only revealed hypertrophy and dilatation of the lymphatics with little cellular infiltration; this indicates that living worms produce little pathological change. On the other hand, in the neighbourhood of dead and dying worms severe inflammatory reaction and massive necrosis of the tissues were observed, which appear to commence with the formation of a lymph thrombus which may possibly strangulate the filaria, and necrosis follows with the formation of a central caseating focus and giant cells resembling tuberculosis, surrounded by lymphocytes with enormous numbers of eosinophils more peripherally. The worms break up and eventually fibrosis results. The authors also deal with the question of secondary bacterial infections, and summarize some of the previous literature and the results of vaccine treatment; they point out that recurrences of inflammatory attacks often take place after six to twelve months, and they are inclined to attribute the benefit to protein shock. Dead disintegrating worms may produce inflammatory changes by liberating toxins and producing an allergic reaction in the absence of actual bacterial infection.

G. W. Harley³ adds one more to the innumerable periodicity theories of filariasis by suggesting that there is "a positive specific chemiotaxis acting on microfilariae to cause them to migrate towards the saliva of an insect host".

DIAGNOSIS.—Further work on intradermal reactions is reported from the Belgian Congo by J. Rodhain and A. Dubois,⁴ who found that the three African forms of filariasis gave similar reactions to those in *Wuchereria (Filaria) bancrofti*, so it is a group reaction. It was more intense in cases of *Ouchocerca volvulus* infections with pruriginous conditions.

N. H. Fairley⁵ has demonstrated his skin test and complement-fixation test with *Dirofilaria immitis* powder in an Indian case of elephantiasis with a positive reaction, and obtained a negative one in a non-filarial case from Palestine. A reaction was also obtained in a loa loa case from the Cameroons with Calabar swellings in which embryos had not been found.

S. S. Rao and M. O. T. Iyengar⁶ have watched the escape of filariae naturally from the extreme tip of the labella of *Culex fatigans* in confirmation of that method of escape as opposed to the old view of rupture of Dutton's membrane.

TREATMENT.—J. C. Paterson⁷ has met with 12 cases of *F. bancrofti* infections in British Columbia, where 1.6 per cent of young adult male labourers were found to be infected, nearly all with involvement of the inguinal glands. **T.A.B. Vaccine** intravenously caused violent temperature reactions, but relieved the symptoms of half the cases without relapse within eight months, but failed in

one elephantiasis case. **Tartar Emetic** was beneficial in one case, but neither form of treatment had any effect on the worms.

REFERENCES.—¹*Trans. Roy. Soc. Trop. Med. and Hyg.* 1932, May 14, 445; ²*Ibid.* June 30, 13; ³*Ibid.* May 14, 487; ⁴*Ibid.* March 31, 377; ⁵*Ibid.* Jan. 30, 220; ⁶*Ind. Jour. Med. Research*, 1932, Jan., 941; ⁷*Trans. Roy. Soc. Trop. Med. and Hyg.* 1932, Aug. 11, 169.

FOOD ALLERGY.

Robert Hutchison, M.D., F.R.C.P.

A great deal of attention has lately been directed to this subject, and especially to its gastro-intestinal manifestations. There is a real danger, indeed, that all obscure disorders of digestion may be attributed to it. This is specially seen in a paper by J. S. Smul,¹ who has coined for these manifestations the cumbersome term 'gastro-enterallergy' with two varieties, 'gastralergy' and 'enterallergy', according to whether the symptoms are gastric or intestinal. He is apparently prepared to include under these headings practically all digestive disturbances. This is certainly going too far. The nature of food allergy is well stated by W. T. Vaughan² when he says: "If, following a banquet, most of the participants become ill, something was wrong with the food. If, on the other hand, with all eating the same food only one individual becomes ill, something was probably wrong with that individual. The first was an instance of food poisoning, the second of food allergy." Proteins or their cleavage products are the usual allergenic constituents of foods, but there is reason to believe that non-nitrogenous substances may sometimes be allergenic too. The symptoms are due to local oedema of mucous membranes and spasm of muscle just as in the case of asthma. Allergy may be present at any age, but is commonest in infancy and childhood. The symptoms may be acute, resembling those of food poisoning, or chronic, simulating those of any organic or functional disturbance of the alimentary tract.

DIAGNOSIS.—The allergic nature of the symptoms may often be inferred from a careful history, especially in the acute cases. If the symptoms occur at intervals the patient should be asked to keep a diary noting down each day everything that was eaten, and in that way a connection between the occurrence of symptoms and the eating of some particular article can sometimes be traced. In the more chronic cases A. H. Rowe's³ trial diets are useful.

Rowe has found that the foods most frequently giving rise to allergic reactions are wheat, eggs, and milk. Next in frequency come chocolate, cabbage, tomatoes, oranges, potatoes, cauliflower, strawberries, bananas, walnuts, carrots, and pork. Among those least likely to cause trouble are poultry, turnips, peas, beans, prunes, honey, beetroot, radishes, asparagus, mushrooms, plums, pepper, vinegar, and tea. Intermediate in frequency are salmon, oysters, lobsters, crabs, shrimps, rice, lettuce, celery, peaches, grapes, cherries, raisins, figs, lemons, almonds, beef, lamb, mustard, and coffee. There are many others. He has drawn up a series of trial diets, each differing from the other as far as possible and containing foods which only rarely produce allergic effects. Each diet is tried in turn for one to two weeks until one is found which does not produce symptoms. This is then used as a basic diet, and to it new foods are added every three or four days, beginning with those least likely to produce allergy. Any food that gives rise to symptoms is then permanently excluded, and eventually the patient will know exactly what foods he must avoid.

Skin tests, such as are used in asthma, are of some assistance also, but most writers find that they are not absolutely trustworthy.

TREATMENT.—If the offending article of food is eliminated altogether from the diet, sensitiveness to it usually disappears in a few weeks or months. Rowe has not found much use from peptone either by the mouth or by injection,

nor from calcium. Smul recommends nerve sedatives (**Bromides** and **Luminal**), **Atropine**, and **Alkalis**. **Adrenalin** (5 to 10 min. of 1-1000 hypodermically) may relieve some of the acute manifestations (Kennedy⁴).

C. Richet and R. Couder⁵ claim success for the simple method of administering **Liquid Paraffin** (1 to 2 oz.) with meals. They believe that it acts by delaying the digestion and absorption of proteins.

REFERENCES.—¹*Med. Jour. and Record*, 1932, Jan. 20, 80; ²*Amer. Jour. Med. Sci.* 1931, Oct., 459; ³*Ibid.* 1932, April, 529; *Jour. Amer. Med. Assoc.* 1931, Nov. 14, 1440; ⁴*Brit. Med. Jour.* 1932, i, 1167; ⁵*Presse méd.* 1932, June 11, 925.

FOOD POISONING. (See FOOD AND THE PUBLIC HEALTH; STAPHYLOCOCCUS INFECTIONS; STREPTOCOCCUS INFECTIONS.)

FOOD AND THE PUBLIC HEALTH. (See also VITAMINS.)

G. E. Oates, M.D., M.R.C.P., D.P.H.

Milk-borne Streptococcal Infections.—W. G. Savage,¹ in a discussion on milk-borne streptococcus epidemics, states that streptococci are extremely common in milk, and are derived from many sources. Their mere presence, or even their presence in large numbers, is no evidence that the milk is harmful. Even the demonstrated presence of hemolytic streptococci is inadequate evidence of potential infectivity, and it is difficult to postulate any series of bacteriological tests which enables us with reasonable facility to determine the infective types of streptococci in milk. On the epidemiological side we are on more definite ground. Two types of infection, now both known to be due to streptococci, have been demonstrated over and over again to have been spread by milk. These diseases are scarlet fever and angina of variable degrees of malignancy. For both we have to consider the possibility of a human and of a bovine origin. The author restates the thesis he advanced over twenty years ago—namely, that the various bovine udder and teat lesions, so commonly met with, are of purely bovine origin and, as such, harmless to man. Occasionally, either as an invasion superadded upon the original bovine lesions or as a primary infection of the milk organs, there is a local infection with organisms of human origin. In such cases the conditions present may be decidedly prejudicial to man. In other words, the cow, in this class of infection, is only potentially pathogenic to man when it acts as an active or passive carrier of organisms of human origin. He considers that work done since that date, mainly in America, strongly supports this hypothesis, and it may now be regarded as the basic fact in the relationship of bovine streptococcal diseases to milk-borne human infections.

F. C. Minetti¹ discusses the important question whether the proportion of milk-borne streptococcal infections in which the cow is involved is large or small. It is commonly considered that this proportion is small. On the other hand, he states, there are strong reasons why in definitely milk-borne outbreaks the extent of the danger from the bovine source should not be under-estimated. The reasons may be stated briefly as follows. The magnitude of many of the outbreaks, in which hundreds or even thousands of people are affected, and their continuous nature, make it difficult to believe in direct contamination from a human source, but point to heavy and continuous contamination of the milk-supply, such as could only arise from growth of pathogenic streptococci within the udder. In some outbreaks exclusion of the suspected cow has promptly stopped the outbreak. The fact that the cow has been proved to be the immediate source of infection in some outbreaks increases the probability that she may be the immediate source in outbreaks with a similar epidemiological history.

E. Wilkinson² describes two recent milk-borne epidemics in England, one of scarlet fever and the other of sore throat, and due to hemolytic streptococci of closely allied though distinguishable types. While, however, the scarlet fever epidemic lasted only for a few days, and the attacks, numbered by tens, were almost limited to persons served by a single roundsman, himself a carrier of infection, the epidemic of sore throat was spread over several weeks, and the patients, numbering many hundreds, received their milk from many roundsmen, none of whom, so far as is known, was infected. The difference in the duration of the outbreaks he attributes, in part at any rate, to the circumstance that scarlet fever is notifiable, this permitting of prompt preventive measures, while sore throat is not.

The difference in their magnitude, however, is only to be explained by the different ways in which infection was spread. The scarlet fever patients probably owed their infections to the direct infection of the milk by the infected roundsman by whom they were served, while to account for the many hundreds of attacks of sore throat occurring among persons living in all parts of the area served by a large dairy, some gross infection must be assumed. It appeared that when the milk from a single farm of the many supplying the dairy was discontinued the outbreak ceased, and it would thus seem that for this milk to have infected so many consumers, greatly diluted as it was with other milk before it reached them, it must have been grossly infected. Such gross infection of milk with organisms pathogenic to human beings is, the author thinks, best explained by the infection of cows, already susceptible owing to the condition of their teats and udders, with organisms derived from a human source. (See also STREPTOCOCCUS INFECTIONS.)

Cow's Milk and Undulant Fever.—S. R. Douglas,³ in a review of milk-borne diseases, advises that in all cases of continued fever of unknown origin the blood serum should be tested for the presence of agglutinin against *Brucella abortus* and a blood culture should be made. There is no doubt that undulant fever, clinically indistinguishable from Mediterranean fever originating from goat's milk, may be caused by the *Br. abortus* of Bang, which is the causative organism of infectious abortion in cattle. This is a common disease in cows, and is becoming more widespread. It is of great economic importance as it causes severe losses to the farmer, although not usually a fatal disease. He emphasizes the important fact that, the cow after aborting may excrete large numbers of *Br. abortus* in the milk and may continue to do this for years. Other animals may be infected naturally with *Br. abortus*—for instance, sheep, pigs, horses, and occasionally dogs. This organism is closely allied to *Brucella melitensis*—in fact, the relationship is even closer than that between the bovine and the human tubercle bacillus. *Br. melitensis* injected into cattle produces abortion with the same pathological manifestations as those produced by *Br. abortus*.

A number of bacteriologists report the diagnosis of *Br. abortus* infection in cases where the Widal reaction is under investigation. W. Parry Morgan,⁴ working in Cardiff, found that 4 out of 143 routine Widal sera gave a high titre agglutination to *Br. abortus* and proved to be typical cases of undulant fever. He also reports the examination of 76 routine samples of mixed milks for *Br. abortus*, 28 of which proved to be infected, after guinea-pig inoculation. C. P. Beattie⁵ reports that 5 out of 28 Edinburgh sera, sent for routine Widal examination, showed the presence of *Br. abortus* agglutinins.

In 47 specimens from the surrounding counties 2 gave a similar positive result. He also examined by guinea-pig inoculation 56 specimens of milk of mixed origin sold from retail shops in Edinburgh, and found 29 specimens—that is, 51·8 per cent—to be infected. W. Dalrymple-Champneys,⁶ speaking

in April, 1932, stated that up to that date 50 cases of endemic undulant fever, excluding laboratory infections, had been reported. He is of opinion that a considerable number of undiagnosed cases occur each year in this country. He states that infection is almost certainly present in 80 per cent of the dairy herds in this country and that some veterinarians and farmers of experience believe that 80 to 90 per cent of our milk cows are affected. This does not necessarily mean that 80 to 90 per cent of the cows are excreting the organisms in their milk at any one time, but a cow once infected seldom or never gets rid of the infection, and the organisms are at any time liable to appear in the milk. He points to the interesting problem presented by the curious discrepancy between this widespread infection of our milk-supply and the small number of human cases reported. The same phenomenon has been observed in many other countries. In Denmark and other great dairying countries human infection by direct contact with infected cattle is very common, and it is difficult to believe that the same is not true to a certain extent in this country.

R. Cruikshank and W. J. Barbour⁷ have examined the incidence of *Br. abortus* infection in a general hospital population and find it so low (less than 0.5 per cent) that they consider the probability of its being a common infection in this country is remote at present. They also examined the blood sera of a number of persons whose vocations brought them into close association with infected cattle and found definite evidence that the bloods of these persons contained agglutinins to *Br. abortus* in a high proportion. (See also UNDULANT FEVER.)

Sugar in the Diet of the School Child.—A. A. Osman⁸ draws attention to the possibility that the child's natural desire for sugar has a physiological basis which can only be thwarted at considerable risk to the general health—that in fact a great deal of minor illness amongst children of school age is due to a relative insufficiency of sugar in the diet. Amongst the major symptoms of sugar deprivation he instances cyclical vomiting, known popularly as 'bilious attacks', which can be prevented in the majority of cases by the giving of sugar. The minor symptoms are numerous and varied, but may be summed up as those of physical and mental exhaustion. For many years the public have been taught and have largely accepted the doctrine that sugar as such is bad for the teeth. As a result there is a considerable prejudice against allowing children extra sugar in the form of 'sweets' and 'tuck'. The author considers that under modern conditions of stress and strain there is more than ever a need for this valuable source of energy, especially on the part of children. Further, the campaign against the use of sugar has been intensified by recent discoveries giving prominence to the importance of the fatty foods, especially those containing vitamins A and D. He considers it of great importance, therefore, that the dental profession should be acquainted with the situation, and should consider whether the evidence that they have offered against the use of sugar from the dental point of view is such as to still justify its condemnation, and, if this is so, whether this essential foodstuff cannot be supplied in sufficient amounts in a form which will not damage the teeth.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1931, Oct., 1703; ²*Brit. Med. Jour.* 1931, ii, 494; ³*Ibid.* 1932, ii, 198; ⁴*Lancet*, 1932, i, 1067; ⁵*Ibid.* 1902; ⁶*Ibid.* 791; ⁷*Ibid.* 1931, i, 852; ⁸*Proc. Roy. Soc. Med.* 1931, June, 1103.

FOOT INFECTIONS AND INJURIES.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Foot Infections.—A careful study has been made of the applied anatomy of the hand, with a view to understanding the rational methods of treatment. No such intense study has been made in connection with tendon-sheath infections in the foot.

M. Grodinsky¹ deals with foot infections of peridigital origin. The purpose of the paper is to describe infections which originate in the region of the toes. He summarizes as follows: A study of a group of foot cases which comprise a clinical entity in that they have a common starting place and, in general, similar routes of spread—the differences being chiefly those of degree of extension before resolution begins or death occurs. The portal of entry is through lesions about the toes, usually on the plantar surface. The common infective organisms are the *Streptococcus haemolyticus* and *Staphylococcus aureus*. The routes of spread are the fascial spaces, described in a previous study (Grodinsky, 1920), and the lymphatic channels accompanying the long or short saphenous veins. The diagnosis consists mainly in an interpretation of the physical signs in terms of anatomic structures so that routes of spread may be accurately determined and anticipated. The treatment of lymphatic infections is conservative until localization has occurred. Fascial space infections are drained as soon as the diagnosis is made, the efficiency of the drainage depending upon the accuracy of the anatomic diagnosis and the location of the incisions. Six representative cases are reported in detail.

Fractures of the Metatarsals.—It was recognized during the war by what simple mechanism the metatarsal bones could be fractured. A sudden twist or lurch of the foot may cause a fracture of the fifth metatarsal. The metatarsal bones may suffer spontaneous fracture—as in soldiers carrying heavy kits. The second metatarsal at the neck of the bone is the most common site and has been called ‘march fracture’.

W. Mercer,² in connection with this fracture, states that there is primarily a falling of the anterior arch, with a secondary spasm of interossei muscles which inhibits the blood-supply to this bone. As, when the anterior arch has fallen, the second is the longest metatarsal and bears most weight in stepping forward, it may happen that the bone cracks at the neck even with the slight trauma of ordinary walking.

In most cases where a single metatarsal is involved, there is little tendency to displacement. Many such cases, therefore, require no further treatment than a plaster-of-Paris case from the toes to just below the knee-joint. The foot should be slightly inverted, at a right angle to the leg, and with the arches of the foot amply supported. In ten days' time the case may be removed and massage and active movements of the various joints started. Union should be firm in about five weeks, and weight-bearing may be permitted in six weeks. A suitable appliance should be placed in the walking shoe to support the arches during the convalescent period. In fracture of the base of the fifth metatarsal, where the fragment is avulsed, prolonged pain and disability are avoided by tacking the avulsed fragment back into place.

Fractures in connection with the bones of the foot frequently are not diagnosed. It is essential that every injury, however trivial it may appear, should be X-rayed at the earliest possible moment.

Multiple Fractures of the Metatarsals.—For these a splint such as the Davis splint (Fig. 19) is recommended. It is left in position for two or three weeks, the patient getting about on crutches. Good reduction under an anaesthetic,

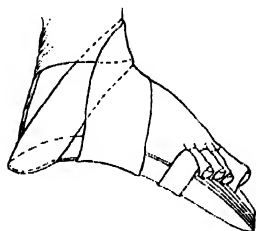


Fig. 19.—Modification of the Davis splint for multiple fractures of the metatarsals. (Re-drawn from the ‘Practitioner’.)

followed by a well-modelled plaster cast, gives satisfactory results. Weight-bearing should be avoided for nearly two months, otherwise metatarsalgia may result, and when weight-bearing is resumed, a metatarsal bar of leather should be applied to the sole of the boot.

Fractures of the Talus.—If there is no displacement, a plaster-of-Paris case is applied from the toes to just below the knee, with the foot at right angles to the leg and slightly inverted. After two weeks the case may be bivalved for massage and active movements. There should be no weight-bearing for six weeks. Sponge-rubber arch supports should be worn in the boot for three to six months. In cases of fracture-dislocations of the talus, the deformity may be reduced if recognized within a day or two. In late cases the best treatment is to remove the displaced fragment.

Fractures of the Calcaneus.—These are the most frequent of the tarsal fractures, with poor functional results as a rule. When the sustentaculum tali is fractured, the spring ligament is usually also injured, and the greatest care is necessary to prevent a flat-foot. An avulsion fracture of the posterior portion frequently requires open operation to replace the fragment, but the prognosis is good.

Fracture of the Body of the Calcaneus.—In a limited experience the reviewer has found that whatever method of reduction is adopted, the end-results from a weight-bearing point of view are poor. Mercer states that reduction of the displacement should be attempted under an anæsthetic. It is a difficult problem, however, and, as would be expected, many methods have been advocated. The chief deformities to be considered are the upward displacement of the posterior fragment and the broadening of the subtaloid portion from compression.

The upward displacement is maintained by the contraction of the calf muscles. At the onset, therefore, these muscles are relaxed by flexing the knee and by plantar flexing the foot. In this position an attempt is made to reduce the broadening of the body of the bone. Cotton advises pounding the heel with a sandbag, while Böhler uses a special *redresseur* which, by means of a screw, produces great lateral compression. Both methods inflict a considerable degree of trauma on the soft tissues, the one by the hammer-



Fig. 20.—Mercer's method of reduction of a fracture of the calcaneus (Re-drawn from the 'Practitioner')

ing, and the other by the slowness of the compression, which damages the blood-supply. Mercer employs the following method, which he believes is an improvement on the two described above: Under a general anæsthetic the foot and leg are prepared as for an open operation. The knee is flexed over the end of the operating table, which is elevated to its full height. A fairly strong metal pin is then inserted through the posterior fragment, and to its projecting ends a loop of rope is attached. To reduce the upward displacement of the

PLATE X

ARRESTED GROWTH IN LONG BONES

(H. A. HARRIS)

Radiograph of the leg of a girl aged 4 years 10 months, showing three distinct lines of arrested growth (**1**, **2**, and **3**) due to successive acute illnesses. Note that the distance between the lines in the femur is greater than that in the tibia in accord with the more rapid growth in the former zone.

posterior fragment, strong traction is exerted by means of the operator's foot inserted through the loop. A special instrument, which is fashioned on the lines of the osteoclast but with special rubber-covered wooden pads, which in the normal foot would fit into the depression below the malleoli, is then employed. The wooden pads are applied, one on each side of the heel, opposite the widened bone, and the handles firmly brought together (*Fig. 20*). The advantage of this instrument is that, while the long handles permit of any degree of compression necessary, that compression is momentary, and therefore, less devitalizing to the soft tissues than the screw.

Fractures of the remaining bones are rare. Fracture of the navicular bone may be produced by direct violence and is often associated with fractures of the other bones. The tubercle may be torn off with the *tibialis posterior* tendon.

REFERENCES.—¹*Ann. of Surg.* 1931, Aug., 274; ²*Practitioner*, July, 1931, 203.

FRACTURES. (See also FOOT INFECTIONS AND INJURIES.)

E. W. Hey Groves, M.S., F.R.C.S.

Variations in Bone Growth.—Since the experiments of Hunter and Du Hamel the general laws affecting bone growth have been understood. But of recent years radiography has added to our knowledge. For many years the existence of transverse lines at the end of the long bones has been recognized and their nature discussed. Until recently they have been regarded as artefacts or a manifestation of rickets. H. A. Harris¹ has, however, in a most painstaking research, proved their nature and demonstrated their bearing on bone growth. These transverse lines are only of exceptional occurrence. They are seen most frequently near the epiphysial lines at the lower end of the femur, the upper end of the tibia, and the lower end of the radius. They always correspond with some period of illness when the growth of the bone is arrested. In the case of delicate children a succession of these lines can be traced, each corresponding to some severe illness, e.g., bronchopneumonia (*Plate X*). When once formed, these lines maintain the same distance from one another, but come to be farther and farther from the epiphysis. Harris gives a histological description of these areas of bone densification and shows that they may be produced experimentally in animals by starvation or disease and that they are strictly comparable to the annular rings formed in timber. From a practical point of view it is important to recognize the nature of these transverse lines and not to mistake them for fractures.

Fractures of the Neck of the Femur.—This subject is one which continues to exercise the minds of all surgeons engaged in bone work, and new suggestions are being made for the treatment, both of recent and old cases.

Ellis Jones² has devised a new grafting operation which certainly has a great deal to be said for it, as far as can be judged by his figures. He starts with the facts, so familiar to us all: (1) That the majority of intracapsular fractures do not unite without very special treatment; (2) That even with forced abduction a large number remain ununited; and (3) That no method can ensure bony union which does not expose the site of the fracture and remove the fibrous tissue and fascia which lie between the bone-ends. The originality of his method lies in the use of a graft cut *in situ* from the trochanter and shaft of the femur, and the attractive point in his suggestion is that the mere act of cutting the graft helps to expose the fracture. A long incision is made on the outer side of the great trochanter, and the latter fully exposed. A piece of bone $\frac{4}{5}$ to 5 in. long and $\frac{1}{4}$ to $\frac{1}{2}$ in. thick is cut out from this part of the bone, including the upper end of the great trochanter. In this way the neck of the femur and the area of the fracture are exposed and can be refreshed and then

placed in accurate position. After this the bone-graft is driven up into a suitable hole drilled in the axis of the neck of the femur (Figs. 21-23). We await with great interest the reports of cases in which this technique has been used.

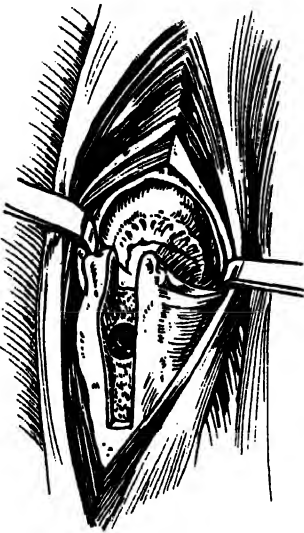


Fig. 21.

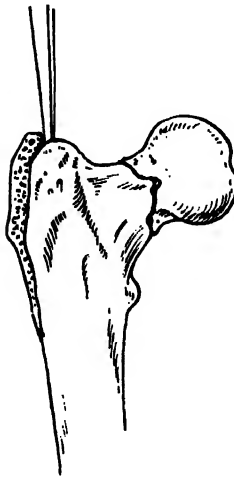


Fig. 22.

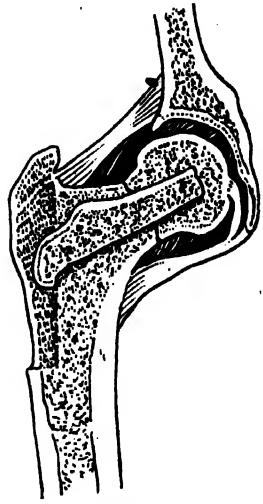


Fig. 23.

Fig. 21.—Showing the fracture reduced and the location and approximate size of the drill hole. The angle of the drill hole is easily determined through this exposure and avoids 'blind pegging.' (Figs. 21-23 re-drawn from 'The Journal of Bone and Joint Surgery'.)

Fig. 22.—Showing the depth and extent of the bone grafts. The graft is removed with a thin osteotome.

Fig. 23.—Diagrammatic section showing the structure of the bone graft. The graft is composed of a major amount of spongy bone, encouraging early vascularization, and only a sufficient amount of cortical bone to maintain firm internal fixation.

In very striking contrast to the bone-grafting method of Ellis Jones is the plan suggested by Smith-Petersen et al.³ This plan begins by what appears to be a very retrogressive step—viz., the dependence upon a massive steel nail for the union of the fracture. But a method which has been tried for more than seven years, and a detailed account of 24 consecutive cases treated by it, demands careful and critical attention. The essential element in the method is the use of a nail about 4 in. long made of stainless steel, the shaft of which consists of three thin blades radiating from the axis, set at 120° from one another (Fig. 24). The exposure is by a curved incision with the convexity

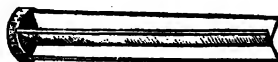


Fig. 24.—Smith-Petersen's operation. Flanged nail used.

inwards, starting along the crest of the ilium and curving round the great trochanter to end about 3 in. below that point (Fig. 25). The capsule of the hip-joint is exposed on the lateral border of the rectus femoris, the origin of the tensor fasciæ femoris muscle being cut through above and the iliotibial band below. This gives a clear view of the whole of the neck of the femur.

The capsule is cut in the form of a flap and turned downwards. The line of fracture is exposed, and displacement reduced and adjusted. A hole is made in the outer part of the shaft just below the great trochanter by means of a three-bladed punch of the same size as the shaft of the nail. The nail is chosen of the exact length required and is driven into place (*Fig. 26*). The thin blades of the nail shaft ($\frac{3}{8}$ in. thick) make it possible to drive the nail home without any drilling other than the hole in the dense wall of the shaft.

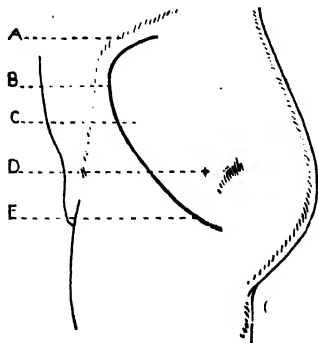


Fig. 25.—Smith-Petersen's operation. A, Crest of ilium; B, Line of incision; C, Tensor fasciae femoris muscle; D, Great trochanter; E, Lower line of incision across iliotibial band.

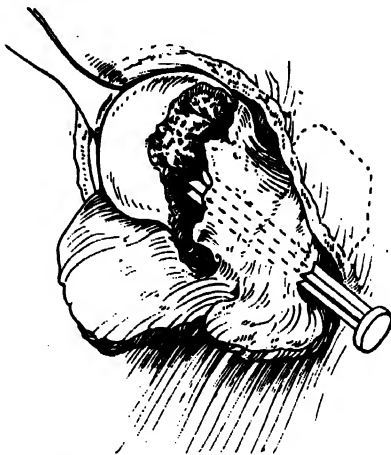


Fig. 26.—Smith-Petersen's operation. Showing distraction of fracture surfaces as the nail enters the proximal fragment. This is overcome, and firm impaction secured, by further hammering.

Firm impaction of the shaft is secured by hammering a tool something like a box spanner which fits over the head of the nail. The capsule, muscles, and skin are separately sutured. The limb is slung on a Thomas splint with slight traction. After the wound has healed a bivalved plaster spica is fitted, and the patient is allowed to walk with crutches. The firmness of fixation by the nail justifies this great shortening of the convalescence. Twenty-four cases are described in detail, with two fatalities; 20 cases are available for consideration of late results. Of these, 15 gave firm bony union. Considering that in the earlier cases the technique was not fully worked out, this percentage (75) of successes is very good.

The operation is simple and easy, and the fact that it gives a prospect of the patient being out of bed in two weeks will make a strong appeal to all those who have found the three months' fixation by Whitman's plaster a very serious difficulty both for the patient and the hospital. The shape of the nail makes it possible to drive it home without boring a hole for it, it ensures a very firm holding of the bone, and it prevents any rotation of the fragments upon one another. The result is shown in *Fig. 27*.

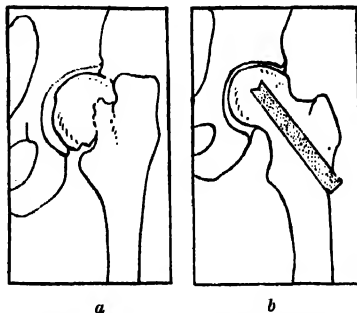


Fig. 27.—Smith-Petersen's operation. Tracings of skiagrams taken (a) before and (b) two days after operation. (Figs. 24-27 re-drawn from the 'Archives of Surgery'.)

firm holding of the bone, and it prevents any rotation of the fragments upon one another. The result is

P. B. Magnuson,⁴ dealing with old cases of ununited fracture, criticizes other reconstructive methods on the grounds that they usually do not make exposure of the site of the fracture and do not give the original head of the bone a chance to re-function. He makes a free exposure of the head and neck of the femur from the front (Fig. 28), and divides the capsule by a cross-bow incision. The neck is brought out of the wound and its upper surface is refreshed and pointed, so as to make it suitable for impaction into the head. The great trochanter is cut off, so as to make it possible to push the reshaped neck into the hip socket. The broken surface of the head is hollowed to receive the neck, and the two parts of the bone are impacted. The trochanter is then re-attached lower down the shaft. The capsule and the wound are closed.



Fig. 28.—a, Exposure of joint cavity and fibrous tissue; b, Line of removal of trochanter; c, Head and neck of femur shaped to fit each other. (By kind permission of the *Journal of the American Medical Association*.)

The legs are kept in a position of 45° flexion and 45° abduction, by means of a special splint which is not illustrated. No plaster cast is used. After eight weeks the patient is allowed to walk with the use of crutches. This method closely resembles that of Whitman's reconstructive operation, but it has the merit of preserving the original cartilage of the femoral head, and if this is viable the prospect of a functional joint is greatly improved. There must, however, be some risk of retaining a necrosed head of bone, which will never grow into place. This risk can be minimized to some extent by noticing whether the tissues of the head are reasonably firm before proceeding with the operation. Magnuson reports no fewer than 17 cases in all of which the results were satisfactory.

Fracture of the Acetabulum: Skeletal Traction applied to the Trochanter.—The accident of central dislocation of the femur is a rare one, and it may present great difficulties in treatment. G. Nastrucci,⁵ working with Putti, makes a useful suggestion. It is that the base of the great trochanter should be transfixed and by means of this a weight traction applied to the limb at right angles to the body line. In this way he has succeeded in reducing the dislocation by the use of 12 kilo force. This method might be held in reserve for any case in which manual traction is inadequate. The patient, being fully anesthetized, a pin, wire, or band is passed from before backward through the base of the great trochanter. By this means a direct pull can be made upon the femur in the line of the femoral neck, using the full weight of the operator's body. If this does not effect the purpose of reduction, then Nastrucci's suggestions may be followed—that of leaving the 12 kilo weight pulling laterally from the side of the bed.

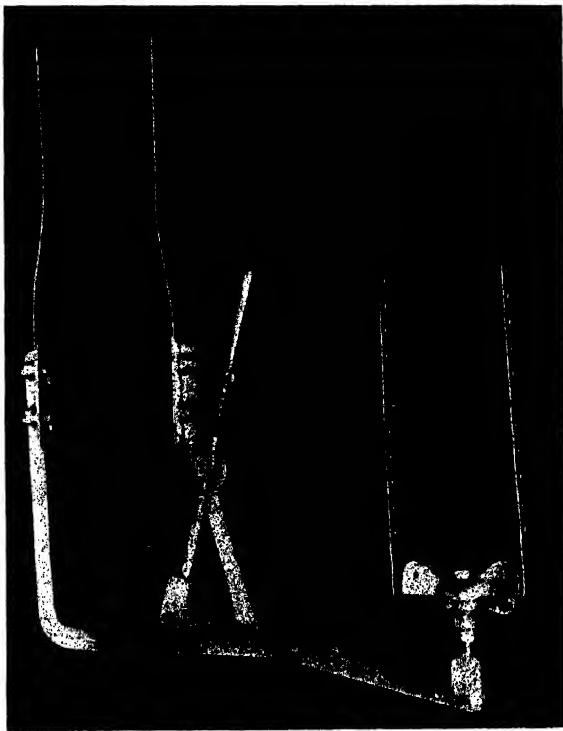


Fig. 29.—Original splint combining skeletal traction of injured leg with counter-traction from the sound leg. (Figs. 29-31 by kind permission of 'Surgery, Gynecology and Obstetrics'.)

Modified Traction Treatment.—Most of the methods of efficient skeletal traction have this drawback, that they require a good deal of more or less complicated apparatus, in the form of special splints and pulleys or attachments to the bed. R. Anderson⁶ has devised an apparatus which gets over this disadvantage and pulls one leg against the counter-traction of the opposite. This appliance consists of three parts: (1) The attachment to the injured leg, which is of the nature of skeletal traction; (2) A counter-traction point, provided by the good leg; and (3) A lever and screw traction which connects the

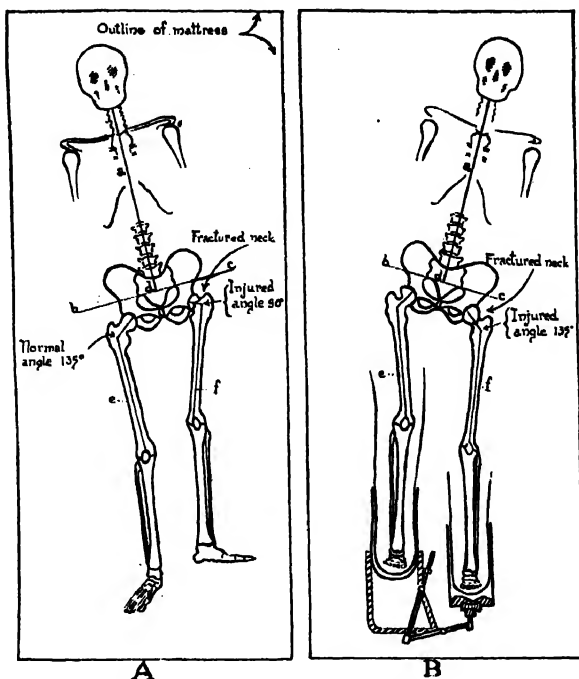


Fig. 30.—A, Position of patient in bed with fracture of the neck of the left femur, before reduction. Notice the usual external rotation and shortening of the injured left femur, with the axis of the neck to the shaft at an angle of only 90° ; the acetabulum of the injured side is displaced upwards. B, After reduction, position of patient in bed with splint. Note restoration of normal angle of the neck upon the shaft. The acetabulum of the injured side is now displaced downward. Also note absence of any pelvic tilt.



Fig. 31.—Intertrochanteric fracture of right femur. Patient sat up and moved around from the first day, but a firm union was obtained, with perfect end-results.

two together. The broken leg is transfixed by a pin or wire through the malleoli and a traction stirrup attached. The good leg is encased in plaster-of-Paris, which extends from the upper part of the thigh down to the foot, and at its lowest end incorporates a metal stirrup. The two stirrups, that on the sound and that on the broken leg, are connected by a transverse lever. This lever has a screw action turn-buckle attached to it, by which the broken leg is pulled down whilst the sound leg is pushed up. This apparatus will therefore pull the pelvis down on the affected side without the limb being placed in abduction. The patient's pelvis and body will be left free from constricting plaster and the hips will be free so that he can sit up in bed (Figs. 29-31).

Fractures of the Forearm associated with Dislocation.—There are two kinds of fractures of the forearm bones which may be associated with dislocation, and this associated injury is one which is very liable to leave serious functional disability.

1. The commoner of these injuries is known in France as the 'fracture of Monteggia'. In it the shaft of the ulna is broken, usually near its upper end, and the radius is dislocated forwards and outwards. The subject was discussed by Algave and L. Ombrédanne⁶ at a recent French Surgical Congress. The general agreement was that in recent cases the chief attention should be paid to reducing and fixing the broken ulna, and that when this is done the radial dislocation will right itself. In old cases the alternatives will lie between doing an osteotomy of the deformed ulna or excising the head of the radius. [We think that the stress laid upon complete and accurate reduction and fixation of the ulna in the first instance is wise, but we venture to doubt very much whether even if this is done reliance can be placed upon the radial head being retained in its proper position. It is certain that complete dislocation of the radial head must involve tearing of the orbicular ligament, and it is difficult to believe that this torn ligament can be repaired even in recent cases by mere replacement. Certainly in old cases where the ligament is destroyed, it must be necessary to replace it by a new ligament, constructed from one of the tendons—c.g., that of the palmaris longus—or by a piece of fascia. The method of this reconstruction of a new ligamentous sling for the radial head is similar to that described and figured in the next injury.—E. W. H. G.]

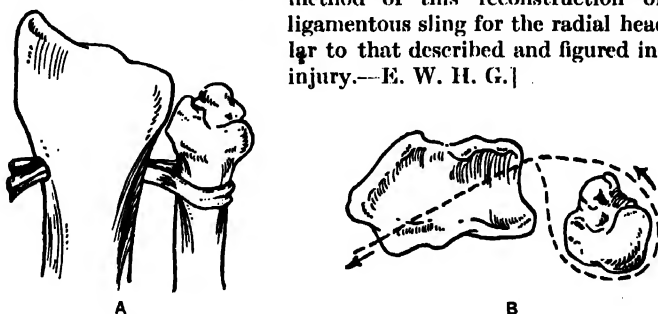


Fig. 32.—A, Position of the fascial sling; B, The dotted line shows the direction taken by the drill hole, the arrow indicating the direction of the pull when the sling is tightened.

(Re-drawn from 'Annals of Surgery'.)

2. The other less common association of a dislocation with a fracture is that of the head of the ulna which sometimes occurs from the same type of accident as causes a Colles's fracture, which fracture may actually coexist with the dislocation. E. L. Eliason⁷ discusses this condition and describes a case in which he cured the patient by means of a fascial sling placed round the neck of the ulna. The bones at the wrist were exposed by a suitably placed posterior

incision. Holes were drilled through the radius and a strip of fascia passed through these and made to encircle the ulna (*Fig. 82*). It was found necessary to tighten up the anterior radio-ulnar ligament and to transpose the ulnar attachment of the pronator quadratus so as to reinforce this ligament. It seems obvious that such an operation affords the only practical alternative to leaving the patient with a deformity which is both weakening and painful. or to excision of the ulnar head.

REFERENCES.—¹*Brit. Jour. Radiol.* 1931, Nov., 561; ²*Jour. Bone and Joint Surg.* 1932, April, 259; ³*Arch. of Surg.* 1931, Nov., 715; ⁴*Jour. Amer. Med. Assoc.* 1932, May 31, 1791; ⁵*Chir. d. Org. d. Mov.* 1932, June, 171; ⁶*Surg. Gynecol. and Obst.* 1932, Feb., 207; ⁷*Bull. et Mém. Soc. nat. de Chir.* 1932, Jan. 16, 18; ⁸*Ann. of Surg.* 1932, July, 27.

FUNGOUS AFFECTIONS OF THE SKIN. (See SKIN, FUNGOUS AFFECTIONS OF.)

GALL-BLADDER. (See also CHOLECYSTITIS, CHRONIC.)

GALL-BLADDER AND BILE-PASSAGES, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

The Incidence of Gall-stones.—At the City Hospital, Vienna, out of 1000 routine post-mortems, gall-stones were present in 32.5 per cent (37.8 of the females and 26.2 per cent of the males). After the fourth decade 25 per cent of the patients had gall-stones; after the seventh 50 per cent. In three-quarters of the cases in which stones were found they were of the mixed (inflammatory) variety. Some disease of the gall-bladder was found in nearly 60 per cent of all autopsies, adhesions being commonest and cholecystitis next. Very few of the patients examined were under 20 years of age. The investigation is published by C. Crump.¹

Black Bile.—B. Desplas and J. Dalsace² describe fourteen cases characterized by what they consider to be a definite syndrome—vague digestive troubles, right abdominal pain, lassitude, and ill temper—associated with the finding at operation of a gall-bladder tightly distended with black bile. There may or may not be stones. In half the cases the bile is sterile. The patients are cured of their physical and psychical symptoms by prolonged drainage, aided by the waters of a spa.

Cholecystography.—A large number of papers have appeared on this subject. According to B. L. Fleming³ (Philadelphia) it enables a correct pre-operative diagnosis to be made in 93 per cent of the cases, but he says that a normal cystogram in a patient with characteristic symptoms is not to be interpreted as trustworthy evidence against gall-stones.

There was a discussion on the subject in March at the Royal Society of Medicine, opened by J. F. Brailsford.⁴ His conclusions were as follows:—

No branch of radiology requires more careful attention to technique and detail than gall-bladder radiology. The X-ray examination should always include (1) a preliminary examination, (2) cholecystography, (3) barium meal, in this sequence. A number of gall-stones can be shown on the preliminary radiograph, and a further number in the cholecystogram, but there still remains a proportion which cannot be seen by X-ray examination. The greater the care taken in technique, the smaller will be the number of gall-stones not indicated. The radiographic demonstration of gall-stones does not necessarily mean that the lesion causing the patient's illness has been discovered. Gall-stones may exist without causing marked symptoms. They may produce symptoms which are atypical. The dye can be administered (1) by the mouth, (2) intravenously. The former is now the best routine method of examination,

though the latter still remains the more accurate. Non-filling of the gall-bladder in about 96 per cent of cases indicates a pathological condition of the gall-bladder, often accompanied by stones, though these may not be shown on the radiogram. Poor filling of the gall-bladder on repeated examination also indicates a pathological condition of the gall-bladder. A good gall-bladder shadow, which is normal in shape, size, and position, uniform in outline and density, which contracts after a meal to a much smaller size, in a high percentage of cases indicates a normal gall-bladder. A small proportion of such gall-bladders may be diseased, and may even contain a small collection of stones. Any abnormality in the area of the gall-bladder before or after it has been filled with dye should be investigated by further radiographs taken according to the type of abnormality seen. Complete gall-bladder radiology provides a fairly accurate opinion as to the condition of the gall-bladder.

The preparation he uses for oral administration is **Opacol**,* which is British made, not unpleasant to take, and causes no unpleasant symptoms, except perhaps purgation. The patient is asked to come for a preliminary radiographic examination, after which he is given a bottle containing the opacol, and is requested to have a fat-free meal, dry toast or biscuits and tea, at 6 p.m., and the whole of the contents of the bottle at 8 p.m. in half a tumbler of water, followed by a further drink of water to remove the taste from the mouth. He is advised to go to bed just before 8 p.m. and to return for X-ray examination at 9 a.m. the following day, having taken no food or drink apart from sips of water since 6 p.m. the previous evening.

L. H. Hitzrot and E. P. Pendergrass⁵, after a detailed comparison in 100 cases of the oral and intravenous methods, arrived at the usual conclusion, that the former is pleasanter and safer for routine use, but less accurate, and that in doubtful cases the intravenous is more reliable. P. Davidson, F. Biguria, and J. Rosenthal⁶ (Boston) prefer a combination, 1.5 gm. of **Sodium Tetraiodophenolphthalein** being given very slowly, in 35 c.c. of distilled water, by the vein at 5 p.m., and two hours later half the usual dose of the oral preparation (**Shadocol**† or **Keraphen**‡) is given by the mouth. They claim that the picture is as good and reliable as with the intravenous method, and the risk less. I. R. Jankelson and W. S. Altman,⁷ of the Beth Israel Hospital, Boston, give **Decholin-sodium**,§ a preparation of bile salts, as well as the dye, to hurry up the result and distend the gall-bladder.

W. E. Davis,⁸ of the Lahey Clinic, says that about 25 per cent of the patients given an intravenous dye injection experience some unpleasant after-effects, which in about 5 per cent are severe enough to cause alarm. He mentions one fatal case (Huddy's). An attempt was made to eliminate these troubles by giving adrenalin, but it did not help. The usual complaints are of pain in the back, choking sensation, nausea, headache, or dizziness.

The Bile-drainage Test.—The value of an examination of bile coaxed down the bile-ducts after swallowing a Rehfuß tube and waiting till it enters the duodenum (when the aspirated contents will be neutral or alkaline, and bile-tinged) and then giving 3 oz. of 10 per cent $Mg_2 SO_4$ solution, is discussed by S. A. Wilkinson.⁹ As a method of treatment it is not of much use, but crystals of cholesterin, or pus, or blood found in the bile may give aid to the diagnosis.

Choledochoscopy.—One would not have thought that the bile-ducts offered a promising field for endoscopy, but even this has been rendered possible by

* May & Baker, Ltd., Battersea, London, S.W.11.

† Kodak Ltd., Kingsway, London, W.C.2.

‡ A. E. Dean & Co., Leigh Place, Brooks Street, Holborn, London, E.C.1.

§ Medical Laboratories, 40, Pall Mall, London, S.W.1.

two Roumanians, E. C. Craciun and V. Steopoe,¹⁰ at Professor Danielopolu's Clinic. The patient is placed on a table with a high bridge, the abdomen opened, the common bile-duct found and opened, and the choledochoscope introduced. Pictures are given of the entrance of the cystic duct, the hepatic duct, and the divarications of the hepatic duct (*Plate XI*).

Diagnosis and Treatment of Gall-stones.—R. P. Rowlands^{11, 12} contributes a good general article on this subject. He points out that there is still a tendency to think attacks of upper abdominal pain must be due to gastric or duodenal ulcer if the patient has never had jaundice. This is often quite erroneous; when the attacks are only occasional and well spaced out, and the patient can tell how many he has had and when, gall-stones is the probable correct diagnosis. He very rightly advises that we should not operate during an acute attack with jaundice, colic, and fever, unless these fail to yield to treatment; in that case, do as little as possible; merely remove stones, and drain. For routine gall-bladder surgery, he uses Kocher's incision. [We prefer Sloan's method.—A. R. S.] He has a death-rate of 1.6 per cent for 434 cholecystectomies, 18 per cent for 116 cholecystostomies, and 12 per cent for 116 choledochotomies. The higher figure for the drainage operation is of course due to its being the method of choice in the least favourable type of case.

L. R. Whitaker¹³ describes a method of shelling out the gall-bladder from its serous coat, which is only opened at the fundus, and removing after tying off the cystic artery and cystic duct. The general peritoneal cavity is to all intents and purposes not opened. One needs to be very sure that the diagnosis is correct, and that the common duct is normal. [All this calls for a degree of 'cocksureness' that is often unfair to the patient.—A. R. S.]

H. Kment¹⁴ gives statistics from the Schloffer Clinic (1912-24): of 427 cases operated on, 6.8 per cent died; of 245 interval operations, the death-rate was 2 per cent; of 117 operated on during an attack, 14.5 per cent died. Of 293 patients followed up, 91 per cent were well enough to work; 18 had died of intercurrent disease. The failures were not in cases with one acute attack, or cases with well-spaced-out attacks, but amongst those with continuous discomfort following an attack, and especially after operation for empyema of the gall-bladder. The routine operation was removal of the gall-bladder, except in the very sick patient.

E. Horgan¹⁵ (Washington) has an L-shaped rubber tube for draining the common duct, with four lateral eyes. The T-tube is apt to tear the duct at removal.

Cholecystitis.—M. F. Dwyer and G. A. Dowling¹⁶ refer to the well-known fact that an infected gall-bladder is a common cause of chronic gastric symptoms, and find that in about 80 per cent of the cases these symptoms are cured by cholecystectomy. They say, "the surgeon should not be hasty in deciding against removal of the gall-bladder because of its normal external appearance if he knows that disease of the gall-bladder was diagnosed after careful clinical, roentgenological, and laboratory examinations."

Chronic Jaundice.—C. A. Moore¹⁷ puts in a plea, first, that every patient with chronic obstructive jaundice should be operated on, and, secondly, that if there are no stones, and cholecyst-gastrostomy has to be done, it should be done in two stages. Simple drainage of the gall-bladder will relieve the jaundice, and greatly improve the condition for the anastomosis operation later. He has had several happy surprises in that patients supposed to have cancer of the pancreas lived happily for many months or years after the intervention.

Complications of Gall-bladder Surgery.—F. G. Connell¹⁸ has had 17 cases of death with a high temperature within forty-eight hours of an

PLATE XI

CHOLEDOCHOSCOPY

(B. C. CRACHUN AND V. STROPOV)

Fig. A.—Hepatic duct and entrance of cystic duct.



Fig. B.—Hepatic ducts bifurcating.

By kind permission of La Presse Medicale

operation on the bile-passages. It appears to be due to some metabolic cause connected with liver degeneration. No effectual treatment is known.

R. Lewisohn¹⁹ (New York) writes on the tendency to bleed in jaundiced cases. In 7 such, the blood was analysed before operation for prothrombin, fibrinogen, and antithrombin. In 4 cases the prothrombin was low and the antithrombin high; these all bled badly and died. In the other 3 the figures were normal, and they did not bleed unduly.

Gall-bladder disease may be complicated by diabetes mellitus. I. M. Rabinovitch,²⁰ presents a study of this condition. He finds that in *chronic* gall-bladder trouble the diabetes does not increase the risks of surgery or spoil the prospects of relief.

Tumours of the Bile-ducts.—These are not so rare as might be supposed. There have been fifteen cases at the Cook County Hospital, Chicago, in less than three years. [We have seen within the past six months two cases in which the growth was successfully removed.—A. R. S.] According to P. Shapiro and R. A. Lifvendahl,²¹ the clinical course was brief; jaundice was not always the first symptom, and metastases are early. Only two cases were operated on, and both died. J. M. Marshall,²² of the Mayo Clinic, writes on the same subject. According to him, metastases are late. Of 45 operated on, 19 died; 3 are known to be alive seven, twenty, and thirty-four months after removal. The rest survived, on an average, about eighteen months, then died.

Cholecyst-gastrostomy.—To avoid infection of the gall-bladder from the stomach, C. A. Roeder²³ detaches the gall-bladder from the liver, makes it tubular by sewing over a rubber tube, and passes it for an inch beneath the muscular wall of the stomach before it pierces the mucosa, much as in Coffey's operation of implanting the ureter in the colon.

Repair of the Common Duct.—The melancholy business of inventing means to repair a bile-duct which the surgeon tore at a previous operation still continues, particularly in America. E. Horgan²⁴ catalogues no fewer than ten such procedures, several of which we have described and figured in previous numbers of the MEDICAL ANNUAL. An end-to-end anastomosis of the duct usually fails. An L-shaped drainage tube should be left to drain the common duct through the abdominal wall, and not removed for several months. H. M. Clute²⁵ reports 25 cases from the Lahey clinic. In 11 cases they were able to do plastic operations to enlarge strictures in the duct; nearly all these did well, but the method is only available when the damage to the common duct is slight. End-to-end anastomosis gave two failures and one success. They have no experience of joining the upper end of the duct to the duodenum or the stomach. Cholecyst-gastrostomy gave a good result in one case. An external biliary fistula was transplanted into the stomach or duodenum seven times: three succeeded and four failed.

[We do not believe these cases are seen with anything like the same frequency in this country, and they ought not to occur. Contrary to the usual teaching, we believe it is good practice when removing the gall-bladder to cut the cystic duct at its distal end, not close to the common duct. Everything *must be clearly visible before cutting*. The removed gall-bladder ought to be examined; if there are two orifices at the deep end instead of one, the common duct has probably been pulled up and its loop cut off. If this is recognized *at the time*, an end-to-end anastomosis over a catheter drain functions very well, and the patient makes a good recovery in the normal time, and has no further trouble.—A. R. S.]

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1931, Oct., 447; ²*Presse méd.* 1932, April, 523; ³*Surg. Gynecol. and Obst.* 1932, Jan., 17; ⁴*Proc. Roy. Soc. Med.* (Sect. Radiol.), 1932, June, 1249; ⁵*Amer. Jour. Med. Sci.* 1932, May, 593; ⁶*Amer. Jour. Surg.* 1932,

March, 525; ⁷*New Eng. Jour. Med.* 1932, April, 796; ⁸*Ibid.* 1931, Sept., 534; ⁹*Ibid.* 1932, April, 843; ¹⁰*Presse méd.* 1931, Dec., 1907; ¹¹*Brit. Med. Jour.* 1932, i, 643; ¹²*Lancet*, 1932, i, 975; ¹³*Amer. Jour. Surg.* 1931, Aug., 273; ¹⁴*Beitr. z. klin. Chir.* 1930, cl. 534; ¹⁵*Amer. Jour. Surg.* 1931, Sept., 504; ¹⁶*Jour. Amer. Med. Assoc.* 1932, Feb., 722; ¹⁷*Bristol Med.-Chir. Jour.* 1932, Summer, 139; ¹⁸*Ann. of Surg.* 1931, Sept., 363; ¹⁹*Ibid.* July, 80; ²⁰*Ibid.* 1932, July, 70; ²¹*Ibid.* 1931, July, 61; ²²*Surg. Gynecol. and Obst.* 1932, Jan., 6; ²³*Ann. of Surg.* 1931, Aug., 311; ²⁴*Surg. Gynecol. and Obst.* 1931, Aug., 225; ²⁵*New Eng. Jour. Med.* 1932, Jan., 47.

GANGRENE. (See BLOOD-VESSELS, SURGERY OF; RAYNAUD'S DISEASE.)

GAS GANGRENE IN CIVIL LIFE. Sir W. I. de C. Wheeler, F.R.C.S.I.

W. M. Millar¹ discusses this question. There are many conflicting ideas as to the rôle of the *Bacillus welchii* in appendicitis. Gas gangrene was known long before the middle of the last century. There is a mortality ranging round 50 per cent. *Plate XII* illustrates sloughing of the abdominal wall and tissues in the gluteal region from gas-bacillus infection following an operation for removal of the appendix. Other forms of gangrene of the skin following abdominal operations have been reported in the MEDICAL ANNUAL (1932, p. 195). As regards treatment, gas gangrene antitoxins combined with tetanus antitoxins can now be procured. Acidosis favours the development of a gas infection and must be countered by the administration of alkalis and glucose. In gas gangrene of the lower extremity immediate amputation should be performed above the knee.

L. Crens² mentions two cases of gas-bacillus infection resulting from hypodermic injections. He suggests that the source of infection may have been the woollen blankets used. He discusses the subject in detail.

Gas gangrene is caused primarily by a group of anaerobic organisms. These bacteria grow best in muscle tissue. We would therefore expect this disease to develop in such wounds as have a diminished oxygen supply and injury or exposure of muscle. Gas bacillus infection most frequently takes place in deep wounds where the depth excludes oxygen. Lacerated and crushing wounds, hæmatomata, and compound fractures offer particularly favourable sites for the development of gas gangrene. Diminished blood-supply to a part favours the growth of the anaerobes and the development of this gangrene. Bowlby points out that he had not seen gas gangrene in wounds about the face, head, or neck, and he attributes this to the copious blood-supply of these parts. Gas-bacillus infection is seen most frequently in wounds about the extremities. This has been explained on the basis of the more frequent contamination with dirt of these parts and also by the poorer collateral circulation in the limbs. Crens feels that the circumferential swelling acts as a tourniquet to produce a further ischæmia which aids the process.

Once the organisms have been implanted, the process extends longitudinally easily, but extension across muscle from one to another is far more difficult. The bacteria grow rapidly at the site of infection. Gas and toxins are elaborated; autolysis of muscle takes place.

The affected muscle appears dull, opaque, and of brick-red colour, resembling cooked meat. Even at this stage it is dead, for it does not contract on stimulation nor does it bleed when incised. Later it becomes softer and gelatinous; its colour changes to green, brown, or black. With the local process under way, gas gangrene rapidly produces a severe systemic reaction. The pulse-rate is quickened and the temperature rises. Acidosis is present. The patient appears gravely ill; the expression is anxious, and signs of some degree of shock soon appear. Unless prompt treatment is instituted radical amputation becomes necessary to save life, and in the more desperate cases death may soon follow.

The importance of early recognition cannot be emphasized too strongly.

Ordinarily the patient is admitted with injury sufficient to cause tissue destruction. After a time, varying from six hours to several days, and in some instances many days, the surgeon observes that his patient's progress is not satisfactory. There is increase of temperature and pulse-rate. Severe pain, out of proportion to the trauma, is complained of in the wound area. Examination of the local condition will reveal a swollen, tender, ecchymotic or brownish area around the wound. Usually there is a thin, foul, pinkish discharge. Pressure about the wound edges may effect the escape of gas bubbles. Palpation may or may not disclose crepitations in the region about the wound. In later cases the part is markedly swollen and discoloured, red, purple, bronze, or brownish; there is a characteristic decayed-meat (sickening sweet) odour; the muscle tissue may appear brick-red or even black; and crepitations can be felt unless the œdema is so great as to hide them. Acidosis is present and so is shock, to some extent. Smears and cultures from the wounds frequently show the presence of the causative organisms. Cultures are really more useful to confirm rather than to make the diagnosis. X rays reveal the gas bubbles scattered along the long axis of the extremity.

As soon as suspicion of gas-bacillus infection is aroused prompt incision (multiple long incision through skin, fascia, and muscle sheaths to promote drainage and aeration and prevent ischæmia) of the area should be performed. In the later cases when destruction of muscle is in evidence most writers advise excision of the devitalized muscle or even group of muscles. In the rapidly spreading, fulminating type prompt amputation is indicated.

The reports on **Serum Therapy** appear contradictory, and the efficacy of the sera (antitoxin *perfringens* and polyvalent anaerobic antitoxin) is still unsettled. Most writers believe that the sera are of some value in conjunction with surgical measures. All agree that serum, if used, should be given early in the disease and in sufficient dosage. Only one of Crens' cases was given serum (antitoxin *perfringens*). This patient was a woman of 65 with a severe infection which proved fatal.

Crens' conclusions are as follows: (1) Gas-bacillus infection should be constantly borne in mind as a possibility in all lacerated and crushing wounds. (2) We should be careful in our original care of these wounds, i.e., more careful with skin sterilization—excision of devitalized tissues—in order to reduce the incidence of gas-bacillus infection. (3) Hypodermic injections should be given with greater care with respect to skin sterilization, and the fluids should, wherever feasible, be introduced subcutaneously and not intramuscularly. (4) Gas-bacillus infection should always be regarded as a serious condition. (5) Early diagnosis and prompt treatment ensure better results. (6) In the diffuse, rapidly spreading, fulminating type affecting an extremity, early amputation becomes the treatment of choice. (7) Gas-bacillus infection in those affected with myocarditis, diabetes mellitus, and other debilitating conditions, is usually fatal. (8) The actual value of the available sera is still disputed. If given, it should be used early and in sufficient dosage.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1932, Feb., 232; ²*Amer. Jour. Surg.* 1931, Sept., 453.

GAS POISONING. (See RESUSCITATION FROM ASPHYXIA.)

GASTRIC AND DUODENAL ULCER, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

CAUSATION.—J. B. Deaver and V. G. Burden¹ (Philadelphia) believe that in the genesis of duodenal ulcer two factors are at work, hyperacidity of the gastric juice and spasm of the pylorus, which prevents the regurgitation of

alkaline juices into the stomach. The former may be due to an exaggeration of the normal 'psychic' flow of gastric juice; the latter may be a reflex from chronic appendicitis or cholecystitis. They therefore advise submucosal removal of the anterior half of the pyloric sphincter, which is simple and satisfactory.

E. Starr Judd³ says that in America a localized duodenitis is very prevalent, without actual ulceration but causing similar symptoms. It may or may not be a cause of ulcer.

GASTROSCOPY.—F. Moutier,³ of Paris, gives some excellent pictures of gastric ulcer viewed with the gastroscope (*Plates XIII, XIV*).

TREATMENT AND RESULTS.—Lord Moynihan⁴ says that for cases of gastric ulcer that do not yield to medical treatment the operation of choice is gastrectomy, which in his hands has a mortality of under 2 per cent. If the ulcer is too big for removal, he performs either jejunostomy, or gastro-enterostomy with transgastric jejunostomy. Out of 700 cases, however, gastrectomy was possible in all but 31. For duodenal ulcer, the choice lies between gastro-jejunostomy and gastro-duodenostomy, always with destruction of the ulcer and temporary closure of the pylorus. He does not approve of resection. In his last 1000 cases of duodenal ulcer, only 1 died, and the frequency of gastro-jejunal ulceration was 1.8 per cent. He concludes:—

General Instructions.—

1. Have your teeth attended to by a dentist regularly every six months.
2. Eat slowly and chew very thoroughly.
3. Avoid tobacco.
4. It is well to avoid all forms of alcohol. If greatly desired a small quantity of light wine or whisky diluted with soda water may be taken at meal times. Avoid all effervescing drinks. Avoid coffee.
5. Avoid all fruits which are acid. The skin or pips of all fruit (whether raw, cooked, or in jam) should be removed. Avoid currants, raisins, lemon peel, nuts, figs. Orange juice with carbonate of soda sufficient to neutralize all acid may be taken occasionally.
6. Avoid all raw vegetables, whether taken alone (celery, watercress) or in pickles or salad. Green vegetables must be passed through a sieve and mixed with butter in the form of a purée. Porridge is allowed only if made with the finest oatmeal. 'Cream of wheat' may be taken with cream and sugar. Sliced tomatoes with plenty of salad oil may be taken twice or thrice weekly.
7. Avoid vinegar, lemon juice, sour fruit, pepper, mustard, curry, chutney, new bread, tough meat, meat cooked a second time, salted fish or meat, pork, 'made-up' dishes, high games, clear or thick meat soup. Salt, if taken at all, must be in very small quantities only.
8. Take plenty of butter and cream. A dessertspoonful of oil before each meal is of value.

Typical Diet for First Few Months.—

Breakfast.—Cream of wheat, sugar, cream. Lightly boiled or poached egg. Steamed fish, fried fish with 'crusts' removed. China tea, weak. Marmalade or other 'Tiptree' jelly. Bread one or two days old, and, if toasted, only lightly browned. Fresh butter freely.

10.30 a.m. to 11.30 a.m.—About 5 to 10 oz. of milk or Vichy water with a small teaspoonful of 'triple carbonate'.

1 p.m., *Lunch.*—Potato soup or other milk vegetable soup. Fish as at breakfast, butter sauce, sweetbread, calf's head, tripe, chicken, mashed potatoes, vegetables through sieve, minced fresh meat. Any form of well-cooked milk pudding. Junket, custard pudding, Italian cream, jellies. Biscuit and butter.

3.30 p.m.—As at 10.30 a.m.

4.30 to 5 p.m., *Tea*.—Weak China tea, cream, thin potted meat or fish sandwich, without salt or flavouring. Sponge cake.

7.30 to 8.30 p.m., *Dinner*.—Like lunch.

10.30 to 11 p.m.—As at 10.30 a.m., but a full teaspoonful of 'triple carbonate'.

By the bedside, boiled milk with 'triple carbonate', to be taken if awakened by hunger.

Drink, preferably Vichy, not very cold. Water with 'Vichy powders' equally satisfactory.

"One further point of great importance: much of the literature concerned with gastric and duodenal ulcer deals with methods directed to two main considerations—the removal of infection, and the local treatment of the ulcer by medication, extirpation, and so forth. Too little consideration—often, indeed, none—is given to the patient. It is not sufficiently realized that there is in many patients a definite susceptibility to this disease, a habit of body, a condition of mind, a temperament, a mode of life, which will not only prepare for the onset of disease, but greatly affect both our power to heal and the tendency to recurrence. Neither medical nor surgical treatment will produce its full effect until a wider conception as to their full responsibility is more adequately realized."

At a discussion at the Royal Society of Medicine in May, 1931, A. J. Walton⁵ repeated his preference for the wedge excision along with gastro-enterostomy, which gives 92 per cent of good results, but spoke in favour of a simple gastro-enterostomy in cases with a very large ulcer, or in poor starters. He allowed that it is uncertain in its action. Gordon Taylor stated that for over ten years he had been an ardent gastrectomist, but increasing surgical knowledge and experience had convinced him that the surgeon must be an eclectic. His present practice for small ulcers near the lesser curvature is excision or cauterization, with gastrojejunostomy or pyloroplasty; for large ulcers, gastrectomy, though in women a sleeve resection may be suitable; for high ulcers near the cardia, gastrectomy or cholecystgastrostomy, jejunostomy very seldom. The risk of a grave anaemia after partial gastrectomy is a real one, especially in women. Perhaps the Schoemaker type of the Billroth I gastrectomy is less liable to this complication than the Pólya.

E. Starr Judd⁶ advises, as the best treatment for duodenal ulcer, local excision of the ulcer, with the cap of the duodenum and a considerable part of the pyloric sphincter, completing the operation as a gastroduodenostomy; but if there is pyloric stenosis, gastro-enterostomy is sure to give relief, and secondary ulceration is unlikely.

J. Burke,⁶ who has been working at the Eiselsberg Clinic in Vienna, gives the figures there for partial gastrectomy for peptic ulcer for the years 1924-30: there were 606 cases (449 of duodenal ulcer, 137 gastric, 17 both, and 3 others); 526 were operated on under ether anaesthesia; in 528 the method was a Billroth II with retrocolic gastrojejunostomy; the death-rate was 5.4 per cent (duodenal 3.8, gastric 10.4).

Bergeret and Caroli⁷ write of an experience of 317 cases of ulcer, of which 185 were treated by partial gastrectomy on the Pólya plan, and 129 by gastrojejunostomy, with a death-rate of 3 per cent for the former and 2 per cent for the latter. Their general conclusions are that gastrojejunostomy is a safe operation and often gives excellent results, and is to be preferred for patients with pyloric stenosis, duodenal ulcer, or large adherent irremovable gastric ulcers; in the last-mentioned they divide the stomach to the left of the ulcer and make the anastomosis to the proximal part of the stomach; it is easy to remove the ulcer-bearing area on a subsequent occasion. For ordinary cases of gastric ulcer they prefer gastrectomy.

Technical Modifications.—F. W. Bancroft⁸ (New York) describes a method of operating for duodenal ulcer in which the stomach is cut across, the open end of the proximal part united to the jejunum as in the Pólya operation, and the mucosa of the pyloric antrum 'coned out'; after this the shell, composed of serous, muscular, and submucosal layers, is sewn up.

W. F. Reinhoff⁹ (Baltimore) describes an operation for duodenal ulcer, of gastroduodenostomy between the stomach and the third part of the duodenum. The reflexion of peritoneum lateral to the outer border of the second part of the duodenum is divided to mobilize it. The author mentions 18 cases thus treated, all with success.

Jejunostomy.—E. H. Mensing¹⁰ (Milwaukee) writes that this unpopular operation is very successful if the patient is treated in a physiological manner. He should be kept away from the sight or smell of food in a private room, and feeding should be maintained in continuous small gushes by an electric pump, so as to eliminate psychical secretion of gastric juice and imitate the gushes of chyme through the pylorus. The feed consists of sugar, peptone, wheat-flour, cream, and milk. The jejunostomy is kept open four or five weeks.

Hæmatemesis.—A number of papers have appeared in France on this subject, by P. Faucher¹¹ (Orleans), R. Grégoire,¹² B. Cunéo,¹³ P. Mourc,¹⁴ and others. French surgeons appear to be much more ready to operate in the presence of a big hæmatemesis than we are in this country. Faucher relates a case in which he obtained a cure by ligaturing the arteries in the lesser curvature of the stomach. If one is operating *à froid*, however, the ulcer should be resected. The discussion showed that a good deal of doubt exists even in the minds of French surgeons whether one is doing the right thing in operating, or exactly what to do if one decides to go on. Mourc advises opening the stomach or duodenum, finding the bleeding point, and cauterizing it.

H. Finsterer¹⁵ (Vienna) contributes three long articles on the same subject. He still claims, contrary to the general opinion in this country, that immediate operation within twenty-four or forty-eight hours is the best treatment for profuse hæmatemesis due to ulcer. He says that the mortality, 4.8 per cent in 42 cases, is much better than that of medical treatment followed later by operation, which he says carries a death rate of 12 to 26 per cent. Even if the diagnosis of ulcer is not firmly established, exploratory laparotomy is less dangerous in elderly patients than conservative treatment would be. The operation should be under local anæsthesia, and the proceeding adopted should be that which stops the bleeding with the least risk. If the general condition is good, resection is best and in suitable cases gives results as good as for uncomplicated ulcer. In doubtful cases, open the stomach to locate the ulcer with the finger. In hæmorrhage due to gastritis, resection is also indicated, and gives excellent results.

Gastro-ileostomy.—A. B. Rivers and D. L. Wilbur,¹⁷ of the Mayo Clinic, contribute an article on the melancholy subject of gastro-ileostomy—that is to say, the misguided surgeon, thinking he was performing a gastrojejunostomy, has united the stomach to a coil of ileum close to the cæcum. They have seen 7 cases. The patient loses weight, suffers from licenteric diarrhœa and, perhaps, fæcal vomiting or belching. [We have seen one case, which presented these symptoms. Food was passed almost unchanged.—A. R. S.] In two cases there was a gastro-ileal ulcer. The treatment is to undo the anastomosis.

Secondary Laparotomy.—F. Starlinger¹⁸ presents a study of 147 cases from the University Clinic, Vienna, that had been operated on previously for gastric or duodenal ulcer, and which for some reason or other were re-opened

at a later date. During the corresponding period 1782 patients had the primary operation. In 44 cases, the second operation was quite soon after the first, for obstruction, peritonitis, or bleeding, and 61.3 per cent died. In 105 cases the second intervention was late; in 61 of these an ulcer was found, either of the stomach, or gastrojejunal; the mortality was 16.4 per cent. In 44 cases no ulcer was found; the largest group of these (20) are classed as 'gastroduodenitis'; 9 are recorded as obstructed opening; of these 44, 4 died.

Gastrojejunal Ulcer.—Gosset and Leriche¹⁹ opened a discussion at the French Congress of Surgery on this subject, and give a very full account of it, from which we extract a few points of special interest. They find that in various clinics it occurs in from 0.5 to 5 per cent cases after gastrojejunostomy, and in about the same proportion when local excision of the ulcer has been combined with the short circuiting. It is particularly frequent (25 per cent) after antral exclusions. "It is frequent after pyloric and antral resections." The best line of treatment is to undo the anastomosis and excise the pyloric sphincter.

D. Balfour,²⁰ of the Mayo Clinic, declares that in cases recurring after a partial gastrectomy of the Pólya type, the best procedure is to resect the ulcer, close the jejunum, and unite the stomach to the duodenum. Recurrence is unlikely. It is useless to make another gastric resection.

A. Fischer²¹ (Budapest) thinks that it is generally better to make an anterior gastrojejunostomy instead of a posterior, as in the former case a gastrojejunal ulcer is easier to treat. [A pessimistic reason!—A. R. S.] For the jejunal ulcer he performs a gastric resection and makes an opening between the afferent and efferent jejunal loops.

L. Zukschwerdt and T. Eck²² (Heidelberg) say that there is little hope of lasting cure after a conservative operation; it must be a resection, which involves a mortality of 14 per cent but gives 93 per cent of lasting good results.

Gastrojejunocolic Fistula.—Leriche and Gosset¹⁹ have assembled 208 cases, of which 35 were not operated on and 27 died; 5 others were explored but nothing was done, and all died. In 150 cases the anastomoses were separated; 22 per cent died. The best results were obtained when the gastrojejunostomy was suppressed: 31 cases with only one death. These are literature figures, partly taken from the Mayo Clinic. The mortality of gastrectomy for this condition is heavy (26 to 46 per cent).

Perforated Gastric Ulcer.—Victor Pauchet²³ has some pungent remarks to make on this subject. The patient must be sent immediately to the hospital or *maison de santé*, with a little scopomorphine to keep him quiet. Do not waste life-saving time by having a consultation at the house. Do not assemble the family to take a decision. Let the surgeon and all the assistants be ready to meet the patient on his arrival where he is to be operated on. Operation under six hours, nine out of ten chances he will live; operation after twenty hours, nine out of ten chances he will die. Spinal anæsthesia is best. If the perforation is recent and the gastric wall supple, close with two points of suture and sew a flap of omentum over all. If large and with friable edges, cut away the edges with the electric knife or needle, and oversew with infolding sutures. If the ulcer is callous and invading the pancreas, this part of the duodenum is to be resected, and the operation finished either by uniting the pyloric antrum to the second part of the duodenum (Billroth I), or if that is not possible, by closing the duodenum and converting the operation into a Pólya. The pelvis is to be drained either by a tube in the pouch of Douglas, or a Mikulicz pack made of two sheets of rubber.

H. J. Shelley²⁴ (New York) quotes 82 cases treated at one hospital. The mortality after simple inversion was 15 per cent, and of cases followed up 43 per cent were cured; with gastrojejunostomy and inversion, the mortality was 23 per cent, but 61 per cent remained cured.

W. C. White and H. G. Patterson²⁵ (New York) find that two-thirds of the patients treated by simple suture remain well; 10 to 15 per cent require a subsequent gastrojejunostomy. The others keep fairly well on medical treatment.

Partial Gastrectomy in the Treatment of Perforated Gastric and Duodenal Ulcer.—As has been indicated in the last two numbers of the MEDICAL ANNUAL, opinion in Eastern and Central Europe has set in the direction of performing a partial gastrectomy for patients with perforated ulcer.

O. Hoche and G. Marangos²⁶ (Vienna) describe 18 cases treated by gastrectomy (Billroth II method) with a death-rate of 22.4 per cent, and have collected from the published records 405 cases of resection within twelve hours of perforation, only 9 per cent of which succumbed.

S. S. Judine²⁷ (Moscow), who has written much on the subject, has done 98 resections, with a death-rate of 11 per cent, which is far better than the usual Russian figures for the treatment of this catastrophe. C. Boehm²⁸ (Schleswig) has improved his mortality from 29 to 21 per cent by adopting partial gastrectomy as his routine treatment. The advantages claimed are that in cases of less than twenty hours' duration the death-rate is very low; any other non-perforated ulcers are removed; secondary operations are made unnecessary; recurrent ulcer is not likely to occur. [We remain unconvinced, for the simple but sufficient reason that this procedure breaks the elemental rule of doing as little as possible to a very sick patient.—A. R. S.]

Treatment of the Forme Fruste type of Perforated Ulcer.—H. A. Singer and R. I. Vaughan²⁹ contribute a paper on the variety of perigastric (subphrenic) abscess which is due to a gastric ulcer. The perforation closes itself after a small leakage has taken place. This leads to the formation of a localized abscess, usually in front of the stomach and below the dome of the diaphragm. They sum up the indications for treatment as follows. If the patient is seen within twenty-four hours, operate at once. If seen during the second day, and it is clear that the peritonitis is localized, wait. If seen later still, it is generally obvious whether the perforation has definitely closed or not. The non-operated cases are treated by emptying the stomach, keeping the patient lying on the left side, and withholding all food and drink. Fluids are supplied by proctoclysis and hypodermoclysis.

Perigastric Abscess.—H. A. Singer and P. A. Rose,¹⁶ of Chicago, writing on perigastric abscess, by which they mean a subphrenic abscess of gastric origin, say that in 29 cases out of 30 there was a clear history of acute perforation of a gastric ulcer, followed often by a period of fair health, then, later, pain, fever, and swelling.

REFERENCES.—[It is perhaps worth while to call attention to the singular fact that of 22 papers reviewed, only two are British.] ¹*Ann. of Surg.* 1931, Nov., 818; ²*New Eng. Jour. of Med.* 1932, Jan., 17; ³*Presse méd.* 1932, April, 681; ⁴*Brit. Med. Jour.* 1932, 1, 1; ⁵*Proc. Roy. Soc. Med.* (Surg. Sect.), 1931, July, 1279; ⁶*Surg. Gynecol. and Obst.* 1931, Nov., 704; ⁷*Presse méd.* 1931, Oct., 1535; ⁸*Amer. Jour. Surg.* 1932, May, 223; ⁹*Ann. of Surg.* 1932, Feb., 183; ¹⁰*Amer. Jour. Surg.* 1932, Jan., 105; ¹¹*Bull. et Mém. Soc. nat. de Chir.* 1931, Oct., 1215; ¹²*Ibid.* 1932, May, 796; ¹³*Ibid.* June, 828; ¹⁴*Ibid.* 913; ¹⁵*Wien. klin. Woch.* 1931, Sept., 1125, 1160, 1185; ¹⁶*Amer. Jour. Med. Sci.* 1932, May, 601; ¹⁷*Surg. Gynecol. and Obst.* June, 1932, 937; ¹⁸*Arch. f. klin. Chir.* 1932, May, 152; ¹⁹*Presse méd.* 1931, Oct., 1481; ²⁰*Ann. of Surg.* 1931, Oct., 489; ²¹*Zentralb. f. Chir.* 1932, March, 790; ²²*Deut. Zeits. f. Chir.* 1932, June, 424; ²³*Rev. de Chir.* 1931, Sept., 473; ²⁴*Amer. Jour. Surg.* 1932, Feb., 277; ²⁵*Ann. of Surg.* 1931, Aug., 242; ²⁶*Arch. f. klin. Chir.* 1932, April, 626; ²⁷*Jour. de Chir.* 1931, xxxviii, 159; ²⁸*Der Chirurg*, 1931, March, 257; ²⁹*Surg. Gynecol. and Obst.* 1932, June, 945.

GLANDULAR FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to H. L. Tidy,¹ glandular fever was fairly frequent in England from 1920 to 1924 and there were many epidemics both in the preparatory and public schools. From 1925 to 1928 glandular fever was rarely seen in this country. There was an undoubted increase in 1929, when epidemics again occurred in schools. The epidemic of 1930 covered the whole of Great Britain. In 1931 there were few cases, but several were in adults in whom the course was abnormal.

W. T. Benson,² who records six sporadic cases in patients aged from 13 to 30, seen in Edinburgh between 1928 and 1931, states that there is no evidence that the disease has assumed an epidemic form in Scotland in recent years, as in various towns in England, although sporadic cases have been recognized from time to time.

SYMPTOMS AND COMPLICATIONS.—Tidy¹ distinguishes the following types: (1) Sporadic type of adults, ushered in by headache and malaise, followed by a maculo-papular eruption and subsequently a stage of moderate glandular enlargement, during which lymphocytosis develops and the spleen may become palpable. An eruption may sometimes be absent. (2) Sporadic type of children: the onset is with sore throat and sudden marked glandular enlargement. There is no eruption. Lymphocytosis is early and usually considerable, but there may be a preliminary stage of leucocytosis. (3) Sporadic type in which the eruption and glandular enlargement appear simultaneously. The lymphocytosis is as in Type 2. The eruption may be maculo-papular or rubelliform. (4) Epidemic type of children. This is the mild type often seen in schools. The glandular enlargement and lymphocytosis are less than in Type 2. (5) Epidemic type of adults. This occurs in attendants on infected children. The glandular enlargement and constitutional disturbance are both trivial. (6) Absence of enlarged superficial glands. Such cases present severe constitutional symptoms, prolonged pyrexia, and late development of lymphocytosis. In most of these cases there is evidence of involvement of mesenteric or mediastinal glands.

S. H. Epstein and W. Damaschek³ record a unique case of glandular fever with *nervous symptoms*. The patient was a youth, age 19, of Russian-Jewish parentage, who was suddenly taken ill with severe headache, blurring of vision and photophobia, followed by stupor. The spleen could be felt one finger's breadth below the costal margin, and there was general enlargement of the lymphatic glands especially in the cervical region. Examination of the blood showed the typical picture of *infective mononucleosis*. Lumbar puncture gave issue to a clear colourless fluid under normal pressure containing 34 leucocytes per c.mm., of which 80 were lymphocytes and 4 neutrophils. Gradual improvement ensued, and finally complete recovery took place.

TREATMENT.—As the cause of glandular fever is unknown, the treatment must be purely symptomatic. Gooding³ recommends that the patient should be kept in bed until the fever subsides and that fomentations should be applied to the enlarged glands. Salicylates reduce the fever temporarily. Gargles and mouth-washes may be given for the sore throat. Fowler's solution by mouth or intravenous injection of arsenic had no effect on the course of the disease.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1931-2, 155; ²*Edin. Med. Jour.* 1932, xxxix, 63; ³*New Eng. Jour. Med.* 1931, ccv, 1238.

GLAUCOMA. (See also CATARACT.) W. S. Duke-Elder, M.D., F.R.C.S.

In a long and detailed paper, T. Axenfeld¹ gives a résumé of his views on the treatment of glaucoma. Operation, he considers, should always be preceded by medical treatment—myotics, epinephrine, ergotamine, hormones,

hypertonic salt solution, and so on. These should be controlled by tonometric measurements taken at regular intervals, and since the tension of the eye tends to be highest in the early morning, this is the time of election for taking the tension. It is most essential that the medicaments should be correctly applied—drops during the day and an ointment at night—and their correct application usually necessitates the presence of a nurse or the training of a competent member of the family. The propaganda for conservative treatment must not cause the patient to fear the operation, or lead him to believe that an operation may be avoided. Undue postponement of operations may cause more harm to therapy in glaucoma than all the benefits derived from modern remedies amount to. It is equally wrong to tell a patient with glaucoma that an operation would never be required, as it is to believe that dietetic and general treatment are sufficient to cure the glaucoma. Treatment of the vascular and nervous systems and of metabolism and blood-pressure, also psychotherapy, however, remain valuable adjuvants to local ocular treatment. The eye is a 'vascular province' in itself, influenced by every part of the body, but largely independent in its change of fluids.

With regard to operation, Axenfeld believes that in acute glaucoma **Iridectomy** is the most effective method. He even thinks that some cases of chronic glaucoma are benefited by iridectomy. In this condition, however, **Trephining** by the method of Elliot gives good results, although he thinks that the accompanying periphery iridectomy which preserves the sphincter of the iris is not always the best method because it may produce posterior synechiae, or may be disturbing in patients with hemeralopia or with progressive cataracts. He inclines to the view (not generally adopted in this country) that trephining may well be done in those cases in which simple glaucoma did not stop after an iridectomy. Congenital glaucoma is a more difficult problem, and for this Axenfeld recommends anterior **Sclerotomy** or **Cyclodialysis**, with the proviso that the operation should be performed early. In the case of adult glaucoma, also, which is complicated by a luxated or subluxated lens, he considers that cyclodialysis is the method of choice, although a trephine may be required at a later date.

Absolute Glaucoma Treated by Retrobulbar Injections of Alcohol.—The retrobulbar injection of alcohol is a suitable procedure in painful absolute glaucoma in those patients who for physical or psychological reasons would tolerate the removal of an eye badly. The technique was introduced by Grüter. After cocaineizing the conjunctiva, 1 c.c. of 2 per cent novocain solution is injected to right and left of the eyeball in the neighbourhood of the posterior pole, by means of a curved Siegrist needle. After five minutes a like quantity of 80 per cent alcohol is injected in the same manner and in the same region. After another fifteen minutes the eyeball is entirely anaesthetic. All the ocular muscles are paralysed, and the eye is immovable. An inflammation of the orbital connective tissue follows with protrusion of the eyeball and chemosis.

G. Fejer² (Budapest) reports five cases treated by this method. The first was a woman of 59 years. In 1929 she had had a classical iridectomy done on the right eye for subacute inflammatory glaucoma, without objective or subjective improvement. No benefit was obtained from amino-glucosan drops followed by corneal puncture. Because of the painful condition of the eye, which was almost blind, with only uncertain light perception and no projection, alcohol injection by Grüter's method was undertaken. Pain ceased from the second day, and the initial chemosis and exophthalmos soon disappeared. Oculomotor paresis remained, but there was permanent relief from pain. The patient was able to use her sound eye without disturbance, and was happy

at having escaped enucleation. The second patient, 75 years of age, suffered from severe pain in the glaucomatous right eye, which was stony hard. The left eye had poor visual acuity. Because of the objections of the family and of the patient, enucleation could not be considered. Alcohol injection was well tolerated, and the pains ceased. In this case also there was permanent oculomotor paresis, and the conjunctiva was anæsthetic. The third patient was a physically and mentally retarded girl. The right eye had been blind since secondary glaucoma following iridocyclitis in early infancy. The left eye was extremely myopic. After alcohol injection the pain became less severe. Noteworthy in this case was a persistent abducens paresis with partial oculomotor paralysis, and also a very extensive initial œdema. Six weeks after the patient was dismissed the eye had to be enucleated on account of return of the pain. Histological examination of the eyeball showed that its inner surface was lined by a thin shell of bone, making it evident that the pain was due to the shrinkage of the eyeball over the bony shell. The fourth case was in a sailor of 63 years. Enucleation of the left eye had been refused eighteen months previously. There was a typical picture of painful absolute glaucoma, with complicated cataract; no light sensation; tension 70 mm. Hg. After alcohol injections the pain stopped, although the eye did not become softer. The fifth patient was a woman of 55 years who came with the complaint that the left eye had been blind for three years, having been operated upon at the beginning of that period, presumably for retinal detachment. For two and a half months she had had severe pain in and around the eye. She received an alcohol injection in the usual manner. During the first days after the injection the pains were absent, there was protrusion of the eyeball, and oculomotor paresis developed, but later the pain returned in increasing severity. A week after her dismissal she returned and gave her consent to enucleation on account of an increase in the boring pain. Histological examination of the eyeball showed the presence of a large melanosaarcoma.

It would seem, therefore, that the operation was a success in all the uncomplicated cases attempted, but of course it must be remembered that it cannot be undertaken with impunity in an eye which still retains useful vision. With this reservation the method is capable of extensive application for the relief of pain. The paresis of the oculomotor nerves must also be remembered. The eye may be completely immobilized, but among the muscles which are innervated by the oculomotor nerve, the one most affected is the levator. The ptosis is always very pronounced, and the ability to raise the lid is especially slow in returning. It seems that the fibres which innervate the levator lie in the outermost layer of the nerve trunk, and they are therefore most intensively affected by the alcohol, since perineuritis or chemical necrosis develops first in this location and continues longest.

A New Iris Inclusion Operation in Glaucoma.—L. Weekers and R. Hubin³ describe a new and very simple technique modified from Holth's original operation for glaucoma, which they have employed in 43 cases. A conjunctival flap is dissected above down to the limbus with a cataract knife, the edge of which is placed perpendicular to the limbus, and an incision 6 or 7 mm. long is made with one or two strokes of the knife, from the surface downward into the anterior chamber. If the iris does not bulge into the wound with the escape of aqueous, it is pulled into it with forceps, and a meridional cut is made with scissors. The conjunctiva is then sutured over the exposed iris. Weekers and Hubin are of the opinion that the hypotension that sometimes results from this operation is advantageous rather than harmful, because of the resulting increased blood-supply with the accompanying improved

nutrition. Some of the especially favourable features of this operation are: (1) the benign post-operative course, (2) the rapid re-formation of the anterior chamber, (3) the rarity of posterior synechia, (4) the greater certainty of the production of a cystoid scar, and (5) the greater degree of reduced tension.

The authors point out that the operation is easy to perform and is well tolerated by the eye. Fifteen cases of acute glaucoma, 18 of chronic glaucoma, and 10 of secondary glaucoma are presented in tables that show the tension before operation and at varying periods after operation. The best results were obtained in primary glaucoma. In secondary glaucoma, although the tension was reduced in the majority, the amount of reduction was not so great as in primary glaucoma.

REFERENCES.—¹*Klin. Monats. f. Augenheilk.* 1930, lxxxv, 478; ²*Amer. Jour. Ophthalmol.* 1932, xv, 135; ³*Arch. d'Ophthalmol.* 1932, xlviii, 186.

GLYCOSURIA. (See DIABETES.)

GOITRE. (See HEART IN GOITRE; THYROID GLAND, DISEASES OF; THYROID SURGERY.)

GONORRHOEA.

Col. L. W. Harrison, D.S.O.

PREVENTION OF SPREAD.—M. Friedmann¹ discusses the reasons for the comparative failure of preventive medicine to lower the incidence of gonorrhœa. One of them appears to be that promiscuity in sexual matters is not now practised so much with professional prostitutes, who accounted for only 16 per cent of the infections in Mannheim in 1926 and were found by Schwink of Nuremberg to have conveyed gonorrhœa at the rate of only once per 226 intercourses. Friedmann has also found a very low ratio of infections to intercourses with prostitutes. Thus in one case 600 intercourses with chance women picked up in different parts of the world has resulted in only 2 attacks of gonorrhœa, and in another the rate was 1 attack per 200 risks of this kind. A much more likely means of spread is the failure of the infected to remain continent even whilst actually under treatment. By various methods he tested 100 patients with gonorrhœa to ascertain if they indulged in sexual intercourse whilst under his care and found no fewer than 37 such sinners. He suggests that patients should be warned against intercourse, not merely at the first consultation, but repeatedly throughout treatment. He found that patients had most erroneous ideas on the subject of minimizing the risk of infection by intercourse, e.g., urination before the act and interrupted coitus. Such misconceptions must be removed by the medical practitioners' frequently repeated warnings.

Wirz² emphasizes the importance of symptomless gonococcus-carriers in the spread of gonorrhœa. In such persons the gonococci often come to the surface (it may be years after apparent cure) only during sexual intercourse. He quotes a number of examples, and stresses the importance of bacteriological tests in cases which appear symptomatically to have made a complete recovery.

DIAGNOSIS.—

Gonococcal Skin Reaction.—J. Neuer³ states that the application of an ointment containing killed gonococci to a scarified area of the skin in a patient with a gonococcal infection produces an inflammatory redness with pustulation in twenty-four hours. He claims that the results of this skin test agree with those of the complement-fixation test.

TREATMENT.—L. W. Harrison,⁴ opening a discussion on the *treatment of gonorrhœa and other cervical discharges in females*, said that at present little attempt was being made to distinguish gonococcal discharges from those due to other organisms, and that he had usually found the treatment of both

which was practised in clinics was identical, though a consideration of the pathology would indicate that it should be different. In the case of discharges due to secondary organisms these were mostly on or close to the surface and therefore more open to attack by chemical agents. In the gonococcal infection, on the other hand, the organisms were below the surface beyond the reach of chemical agents, and attempts to destroy them by frontal attacks led only to disappointment. Often enough the methods employed in following such a plan reduced the resistance of the tissues, besides making them a prey to the numerous organisms normally found in the vagina. Efforts should, therefore, be concentrated first on diagnosis of the etiology of the condition. For the diagnosis of gonorrhoea he employed not only microscopical examination of smears of discharges from the various passages, but also cultures of the same discharges and the complement-fixation test with a gonococcal antigen. With regard to the value of cultures, he said that but for them the diagnosis of a gonococcal infection would not have been made at the first examination in 55 out of 225 consecutive cases of gonorrhoea in females dealt with at his clinic. Such methods of diagnosis as he had outlined had shown that in 294 consecutive cases of vaginal discharge seen at his clinic no fewer than 152 were non-gonococcal.

With regard to the treatment of non-gonococcal infections, whilst these were amenable to direct attack by chemical antiseptics, these must be applied precisely to every part that was affected, and for this reason amongst others he preferred to use such an agent as **Mercurochrome-220**, which dyed the areas dealt with and so showed up any which the dressing probe had missed. He used a strength of 10 per cent to ensure prolonged action of the remedy in bactericidal strength before it became diluted down by vaginal discharges.

In gonorrhoea reliance should be placed on **Drainage** and on **Raising the Patient's Resistance**.

The first was achieved by cleansing douches and applications which promoted an outpouring of serum from the tissues; for such a purpose **Glycerin** was very valuable.

With regard to resistance, without a gauge one was very much in the dark, not knowing whether or not the measures employed, e.g., **Vaccines**, were achieving their purpose. Such a gauge was the gonococcal complement-fixation test. This had been shown in reliable hands to be reasonably specific and sensitive, and those pathologists who disbelieved in it ought to look to their technique. With regard to its value as a gauge of resistance, the author mentioned work by D. Thomson during the War and more recently by Clements, Oliver, and Hughes at St. Thomas's Hospital, which went to show that the clinical progress towards recovery often ran parallel with increase in the strength of the reaction. For example, in a number of cases which had remained gonococcus-carriers, often with only slight symptoms, for many months, the gonococcal complement-fixation reaction had been found to be negative or only doubtful. Then treatment had been commenced with a special vaccine prepared by Oliver on the principles discovered some years ago by Dimond at the Royal Herbert Hospital, Woolwich, and in those cases (the majority) in which the titre of the complement-fixation reaction had been raised the gonococci had disappeared; in those, on the other hand, in which the treatment had failed to raise the strength of the reaction the gonococci had remained. Clements's work had shown that there was a wide difference in the response of patients to vaccine treatment both in respect of general reaction and of effect on the resistance. The administration of vaccines ought, therefore, to be far more individual than commonly obtained at the moment.

To sum up, in a case in which the disease persisted and the complement-fixation reaction had not reached a fairly high titre after some weeks, the first thing to do was to raise the resistance by means of a vaccine, and if one brand of vaccine and one method of administration did not succeed, others should be tried. If the titre was found to be high and yet the gonococci persisted, some focus was probably not being drained properly; it must be searched for and the drainage improved. Examples of the importance of this could be found in the more easily observed male urethra, where often enough the opening out of a peri-urethral infiltrate had brought a hitherto persistent gonorrhœa rapidly to an end. [The special vaccine mentioned above is composed of polar bodies formed by the gonococcus when this is grown on a special medium. It is administered intracutaneously and has proved more successful than any other vaccine I know in raising the strength of the complement-fixation reaction; I have often found this reaction quite negative or only doubtful after a course of one of the ordinary vaccines injected subcutaneously. It is possible that the intradermal route is a powerful factor in the success of this method of treatment, and at present this is being investigated, ordinary stock vaccines being given in such a manner as to cause a wheal in the skin; the commencing dose has been fixed provisionally at one-third of that employed when the route is subcutaneous.—L. W. H.]

Immunization by Intradermal Injections of Gonococcal Toxins.—B. C. Corbus⁵ reports good results from the intradermal injection of filtrate of an ascitic broth culture of gonococci. In 1922 Müller showed that in gonorrhœa an intradermal injection of a small dose of the milk product, Aolan, produced an increase of discharge. Corbus accordingly made an exhaustive study of the literature on intradermal medication. He found that in the last few years three methods of approach had been opened in the defensive mechanism of immunity in man. These are the cells that are immunized (the reticulo-endothelial system), the route of injection (the skin), and the immunizing agent.

The method of influencing disease through the skin was introduced by Jenner in 1796; he is justly called the founder of cutaneous therapy. The skin is not merely a covering; it is a great immunizing agent. The true skin, which is mesoblastic, is composed of a network of elastic fibres interlaced with connective-tissue elements. Its rich vascularity makes it possible to bring large quantities of blood to the skin and at the same time the histiocytes of the connective tissue act as receptive cells. The histiocytes play an important part in immunization; according to Max Goldzieher and S. M. Peck, they respond more quickly to bacterial toxins than to the bacteria themselves. The authors therefore obtained a **Gonococcal Toxin** and treated with it 192 persons in various stages of gonococcal infection. The dose in an acute case of three to seven days' duration began with 0.10 c.c. and increased in successive weeks to 0.25, 0.35, 0.50, 0.75, and 1.0 c.c. If the infection was older, say four to five weeks, when injection treatment was begun, the initial dose was 0.75 c.c., but as a rule in no type of case was it increased beyond 1.0 c.c. In children aged 1 to 10 years the dosage was 0.05 c.c. for one week, 0.1 c.c. for two weeks, 0.2 c.c. for three weeks, and then 0.25 c.c. until a cure was established. An unduly large reaction in the seat of the infection or the site of the injection was regarded as an indication not to increase the next dose. Successive injections should be at least 6 in. apart; otherwise the tissues at the site of the injection become solid from the inflammatory reaction, and even necrosis may result. This inflammatory infiltration is anaphylactic and known as the 'Arthus phenomenon'. According to Opie, it is due to the meeting in the site of antibody and antigen. [The results obtained by Corbus when compared with those referred to above by Clements and Oliver with another gonococcal product force one to think that a powerful factor in the immunization is the

route of administration, and it may well be that the days of the subcutaneous route for immunization purposes are numbered. For some time I have given all gonococcal vaccines by the intracutaneous route.—L. W. H.]

S. Lomholt⁶ considers the **Silver Preparations** to be on the whole the most reliable for local treatment of gonorrhoea. As most of those employed become inert silver chloride in a comparatively few seconds after injection, he thinks there is no point in making the patient retain the solution within the urethra for the five, ten, and fifteen minutes usually advocated. The change to silver chloride occurs more slowly with albargin and protargol than with silver nitrate (40 to 60 seconds as compared with 5), so that the former are preferable in the early acute cases. He recommends that the patient should inject the urethra three times at each treatment, holding the solution for about twenty seconds after each filling of the urethra.

G. Hopf⁷ recommends as a urinary antiseptic a proprietary preparation known as **Uro-Med.**^{*} It is sold in the form of dragées each containing camphoric acid, phenyl salicylate, and urotropine, of each 0.075 grm., and anæsthesin (Hoechst) 0.01 grm. The camphoric acid is sedative and clears the urine, also it favours the change of the urotropine to formalin, especially in those with alkaline urine. The phenyl salicylate is in a dose which is unlikely to evoke irritation of the stomach or other untoward salicylate effects, and the anæsthesin counteracts any irritant effects which the other constituents of the preparation may have on the stomach.

J. Werther and H. Koster⁸ report on the treatment of 510 cases of gonorrhoea (250 women and 260 men) with **Malaria**. The average time from inoculation to discharge from treatment was 37.8 days in the women and 30.9 in the men. The percentage found still to have gonococci in the discharges immediately after the fever was 15.6 in the women and 5.1 in the men. Local treatment was also applied, and the authors think that the effect of the malaria was to make the tissues more permeable to the local remedies. The incidence of complications at commencement of treatment was interesting. In the 250 women there were 32 with salpingitis, 1 arthritis, 1 tenosynovitis, and 18 proctitis, while in the 260 men were 72 epididymitis, 30 prostatitis, 9 prostatitis and epididymitis, and 7 arthritis. There was 1 death from malaria, in a woman aged 24 who presented no contra-indication, but died suddenly two days after the fourth paroxysm.

F. S. Mainzer⁹ has tried a number of non-specific proteins in *gonorrhœal ophthalmia*, and of them all prefers **Skimmed Milk**. He prepared it by boiling for three minutes in a water bath, and injected it into the gluteal region. His dosage is large: thus to a child he gives 8 c.c., and increases this in successive injections given on alternate days to 12, 15, and 15 c.c. The result of an injection is a smart rise of temperature, and usually two injections suffice to bring the conjunctival inflammation and swelling under control. [Many workers have advocated milk injections for gonorrhœal ophthalmia. One thought he got better results the less sanitary the precautions over the milking. This suggests a reason for its effect rather different from Mainzer's, who considers this due to a variety of enzymes in the cleavage products of the milk. Personally I should be afraid of tetanus from injecting milk that had only been boiled, and always have it autoclaved before use.—L. W. H.]

W. G. Terwilligen¹⁰ reports on the treatment of forty-two infants with *vulvovaginitis* by injections of **Vaccine**. The second or third dose usually caused an exacerbation of symptoms, after which an improvement set in. The vaccine proved a useful means of detecting latent cases as it provoked a flare-up and

* Bayer Products Ltd., 19, St. Dunstan's Hill, London, E.C.3.

made the diagnosis easy. By the routine use of the vaccine he freed the institution of vulvo-vaginitis for the first time in five years.

Keratoderma Blennorrhagicum.—D. Lees and G. H. Percival¹¹ contribute a valuable article on the somewhat rare condition keratoderma blennorrhagicum. The article, which is well illustrated with photomicrographs of the histology and illustrations of the lesions, cannot with justice to it be summarized here but should be studied in the original. The treatment advocated is: (1) Eradication of the gonococcal infection in the prostate, vesicles, and other involved areas of the genito-urinary canal; (2) Measures to alleviate the arthritis with which the condition is always associated; (3) Attention to the general health; (4) Measures to improve the resistance. These include **Vaccines**, and sometimes very small doses of '914' help considerably.

REFERENCES.—¹*Munch. med. Woch.* 1931, Sept. 11, 1550; ²*Ibid.* 1932, lxxix, 3; ³*Wien. klin. Woch.* 1932, March 25, 398 (ref. *Jour. Amer. Med. Assoc.* 1932, June 18, 2256); ⁴*Proc. Roy. Soc. Med.* (Sect. of Obst. and Gynecol.), 1932, April, 25; ⁵*Jour. Amer. Med. Assoc.* 1932, Feb. 13, 532; ⁶*Munch. med. Woch.* 1932, June 24, 1024; ⁷*Ibid.* 1935; ⁸*Dermatol. Woch.* 1931, xciii, 1893; ⁹*Med. Jour. and Record*, 1931, Oct. 21, 371; ¹⁰*Canad. Med. Assoc. Jour.* 1931, Sept., 294 (ref. *Jour. Amer. Med. Assoc.* 1931, Oct. 31, 1332); ¹¹*Lancet*, 1931, ii, 1116.

GRANULOMA INGUINALE. (See CHANCROID.)

GRAVES' DISEASE. (See THYROID.)

HÆMATOMA, SUBDURAL. (See HEAD INJURIES; SUBDURAL HÆMATOMA.)

HÆMOPHILIA. (See HÆMORRHAGIC DIATHESES.)

HÆMORRHAGIC DIATHESES, THE.

Stanley Davidson, M.D., F.R.C.P.E.

Classification.—T. R. Waugh¹ discusses the classification of the hæmorrhagic diatheses, and states that there are three main groups of cases: (1) Those characterized by alterations in the coagulability of the blood with no marked reduction in the platelets; (2) Those with marked thrombocytopenia; and (3) Those with normal blood findings, at least as far as the hæmorrhagic factor is concerned, but in which a vascular dysfunction stands out as of paramount importance. [This is a thoughtful, well-reasoned paper.—S. D.]

Hæmophilia.—Schloessmann² states that **Blood Transfusion** in amounts from 300 to 800 c.c. is still the best remedy for hæmorrhage, but it does not exert a permanent effect on the hæmophilic state. The author concludes that the coagulability of the hæmophilic blood cannot be increased by the injection of any substance into the circulation, and control of distant hæmorrhage cannot be achieved in this manner. Roentgen irradiation of the spleen has failed. The vitaminous remedy, **Nateina**, introduced from Spain, is claimed to be a definite advance in the treatment of hæmophilia. By its use the symptoms of the disease are considerably diminished, but some cases completely fail to react to it.

In view of the claims by previous workers of the value of **Liver** in the treatment of hæmophilia, the negative report by A. Marlow³ is of importance. The daily oral administration of raw beef liver in large amounts to four patients with hæmophilia for eight to eleven weeks produced no improvement of symptoms or significant changes in the coagulation time of the blood. Similar negative results were noted during the oral administration of tissue fibrinogen to two of these patients, and nateina to one of them. On the other hand, the intradermal injection of animal **Serum** in two patients who had previously

been sensitized to the serum produced a prompt decrease in the coagulation time of the capillary blood which persisted for more than twenty-one days. The coagulation time of the venous blood, however, was not affected and there was no improvement of symptoms.

Splenectomy in Splenic Anæmia, Hæmolytic Jaundice, and Purpura Hæmorrhagica.—At the Centenary Meeting of the British Medical Association, held last summer in London, an interesting discussion took place on the indications for splenectomy and the results which might be expected to follow the operation in certain diseases. Unfortunately, little evidence of a statistical nature was submitted from which the members could draw conclusions as to the correctness of the views expressed. Presumably no individual in this country has had a series of cases sufficiently large to justify statistical analysis. This is not surprising when J. J. Pemberton,⁴ in his analysis of the results of splenectomy carried out in the Mayo Clinic during the past twenty-three years (1908–31), submits a series of only 326 cases. In 166 cases the reason for operation was splenic anæmia, in 118 hæmolytic jaundice, and in 41 purpura hæmorrhagica.

The operative mortality of the *splenic anæmia* group was 9.6. Eighty of the remaining survivors were known to be living at the time of publication. The prognosis was much worse in patients with impairment of hepatic functional activity, as estimated by the brom-sulphphthalein test. Of the 46 patients with cirrhosis of the liver who survived the operation, 50 per cent are still alive. The author suggests that this furnishes proof of the wisdom of accepting for operation patients with advanced Banti's disease. Further, it indicates the remarkable power of the liver to regenerate, following the removal of the diseased spleen. In approximately 50 per cent of the 98 cases in which there was gastro-intestinal hæmorrhage before operation, there had been one hæmorrhage or more subsequent to splenectomy. In the hope of promoting additional collateral circulation some form of **Omentopexy** is indicated in selected cases as a measure supplementary to splenectomy.

Of the 118 cases of *hæmolytic jaundice*, 4 died in hospital. Conclusive evidence was found of disease in the gall-bladder, with or without stones, occurring as a secondary complication in 81 cases. Secondary affections of the liver were present in 55 cases. For these two reasons alone operation is indicated in this disease. The later results were gratifying: 86 per cent of the patients who recovered from the operation are living, and 83 per cent of these are in good health.

Splenectomy was performed for *hæmorrhagic purpura* in 41 cases between 1923 and 1931, with 2 deaths. The author claims that the results of operation are dramatic. Of the 39 patients who survived the operation, all but 3 are alive and in good health.

(See also SPLEEN, SURGICAL AFFECTIONS OF.)

REFERENCES.—¹*Canad. Med. Assoc. Jour.* 1931, Sept., 331; ²*Zentralb. f. Chir.* 1931, 859; ³*Johns Hopkins Hosp. Bull.* 1931, July, 49; ⁴*Ann. of Surg.* 1931, Oct., 755.

HÆMORRHAGIC DISEASE OF THE NEWBORN. (See NEWBORN, HÆMORRHAGIC DISEASE OF.)

HÆMORRHOIDS: THE INJECTION TREATMENT OF INTERNAL PILES.

J. P. Lockhart-Mummery, F.R.C.S.

This treatment for piles, although it has been in use for forty years or more, has become more popular in the last few years. When it was first employed in the 'nineties' a great many people used it who had no special knowledge of rectal surgery, and the technique used was clumsy and unreliable. While

good results were often obtained, some very bad results occurred and the treatment became seriously discredited. If the treatment is properly done, it is very effectual and quite safe, but it requires a good deal of skill and very careful judgement, not only in knowing which are suitable cases for the treatment, but also in estimating the position and amount of the injection. Perhaps, unfortunately, the treatment seems so easy that many doctors are tempted to carry it out without any adequate experience of the technique, so that bad results and serious complications occur which discredit the method. There are signs that the popularity of the treatment is declining at the present time for this reason, but in expert hands the method is of real value, and will have a permanent place in the treatment of piles.

There are two main methods of treating piles by injections, although the principle involved is the same in both. The object is to inject an irritant solution into the cellular tissue of the pile in order to produce a sclerosis of the tissue which will result in shrinking of the whole vascular area. The first effect of the injection, as has been shown by Cuthbert Dukes, is to produce a small round-celled infiltration of the cellular tissue. This is an aseptic inflammation of all the tissues, and it is followed in a few days by definite thrombosis of the vessels in the hæmorrhoidal area. But the thrombosis is not the primary condition; the success of the injection depends upon the solution being introduced into the cellular or connective tissue; if it is injected into the veins themselves it will do no good, as it is immediately swept away in the circulation.

As already stated, there are two main methods. One is to use a strong solution of **Carbolic Acid**, 10 to 20 per cent, dissolved in glycerin and water, and to inject a very small quantity of it into the centre of the pile. The amount injected varies from 2 to 6 min. The other method is to use a weaker solution, consisting of 5 per cent carbolic acid in almond oil or some other vegetable oil, and to make the injection into the upper part of the pile area just under the mucous membrane. On no account must the solution be made up with liquid petroleum, as this is not absorbed and forms small permanent cysts under the mucosa. The stronger solution must never be placed under the mucous membrane, as it will result in ulceration; but if too much is not injected, it is quite safe in the centre of the pile. When the weak solution is used the amount injected is from 2 to 5 c.c. at a time. The weak solution in oil gives excellent results, but a combination of both methods is often the best.

The types of case which are very suitable for treatment by injection are :—

1. Cases where the piles are in an early stage, where there is occasional bleeding, and where perhaps occasional prolapse occurs but the piles can be easily returned.

2. More severe cases where the patient cannot afford the time to be operated upon, or when for some other reason operation is contra-indicated and it is necessary or advisable to tide him over till a more suitable time for operation arrives.

3. In very nervous people who are unable to face an operation.

It is contra-indicated :—

1. In cases complicated by other lesions, such as fissure, fistulæ, ulceration, or where fibrosis of the pile exists.

2. Where the piles easily prolapse and have to be returned with the hand.

The treatment by injection is not very permanent, and recurrence within a few years is the rule rather than the exception. On the other hand, the immediate results are excellent and the treatment can always be repeated. It has the great merit from the patient's point of view that he is not laid up and need not alter his usual occupation.

A slight amount of discomfort for a few hours is quite usual, but should not be serious enough to cause the patient any real inconvenience. Serious complications, such as severe pain, ulceration, or abscess and fistula, have been known to occur, but only as the result of inexpert technique or the choice of unsuitable cases.

The subject of the injection of piles was very fully discussed at the Meeting of the Subsection of Proctology at the Royal Society of Medicine.¹ The consensus of opinion was in favour of using a 5 per cent carbolic solution in oil, and there was very general agreement as to the advantages of the treatment in suitably selected cases.

R. V. Gorsch² considers that 50 per cent of cases of piles are suitable for treatment by injection. He prefers to use a weak solution of carbolic introduced submucously and limited to 5 c.c. in amount at one time.

R. Maingot³ believes that the treatment is contra-indicated in cases of advanced cardiac, renal, or hepatic disease, and where the piles are associated with other local lesions. The injections should be made at weekly intervals, and about from four to six sittings are required in an average case.

P. G. McEvedy⁴ advises the use of 5 per cent carbolic in oleum arachis. A small quantity of the oil is warmed, and the carbolic crystals are added. When the crystals have dissolved the remainder of the oil is added. The solution should not come into contact with water. The injection is made subcutaneously and is stopped as soon as a stippled appearance of the injected area is produced. He mentions as possible complications of the treatment a transient unconsciousness lasting a few minutes. He believes this to be due to too large injections at one time. He also mentions influenza-like symptoms commencing within twelve to twenty-four hours after an injection. These symptoms are accompanied by a rise in temperature to 101° F. at night. He believes this complication to be due to unsatisfactory solutions.

Dr. Weiss⁵ describes his method of injecting piles with **Antiphlebin**, a strong solution of quinine salt; 2 to 3 min. of the solution are injected deep into each pile, and after five days the treatment is repeated, using 1 min. He claims good results for this method.

Injections of quinine and quinine-urea solutions were much advocated a few years ago, but have been discontinued by most surgeons, as it was found that they were liable to result in suppuration.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1931, Aug., 1451; ²*Med. Jour. and Record*, 1932, March 2, 216; ³*Med. Press and Circ.* 1932, May 4, 363; ⁴*Lancet*, 1932, Jan. 2, 17; ⁵*Munch. med. Woch.* 1932, Feb. 26, 346.

HAND, LIPOMATA OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

F. H. Straus¹ discusses this subject. Deep lipomata about the hand and foot are very seldom identified before operation. The condition is extremely rare. There is a striking similarity between a deep lipoma and the very much more common compound ganglion. A lipoma is also likely to be confused with hygroma of the tendon-sheath or tuberculous tenosynovitis. (*Plate XV.*)

REFERENCE.—¹*Ann. of Surg.* 1931, Aug., 269.

HANDS AND FINGERS, INFECTION OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

H. C. Edwards¹ gives a practical account of the treatment of common septic conditions about the fingers and hand.

In pricks and puncture wounds he recommends excision of the small track, thus removing the infecting organisms (*Fig. 83, A*). When the pulp is more diffusely infected the well-known crescentic incision is employed and kept

open by means of a rubber dam (Fig. 33, B). For the subacute infections round the nail the incision is H-shaped (Fig. 33, C). If pus is under the nail the latter should be removed without hesitation. By removal of the nail the repair is greatly accelerated.

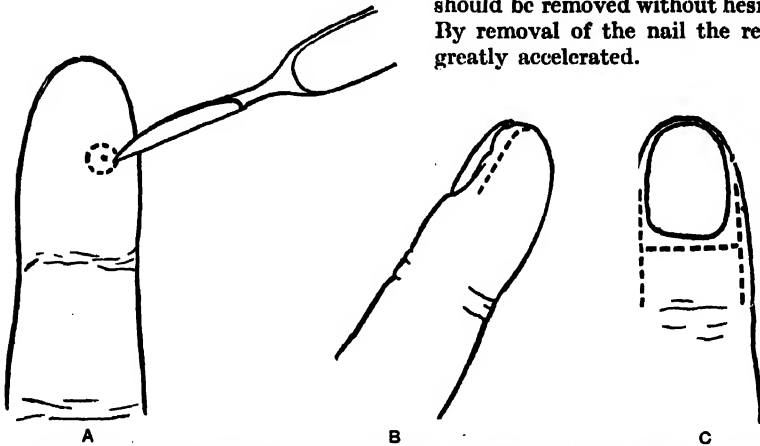


Fig. 33.—Treatment of septic wounds of the fingers. A, Excision of septic track; B, Crescencic incision; C, H-shaped incision. (By kind permission of the 'Clinical Journal'.)

In acute cases with red lines up the arm and with a high temperature and enlarged axillary glands, prompt operation at the seat of infection is indicated.

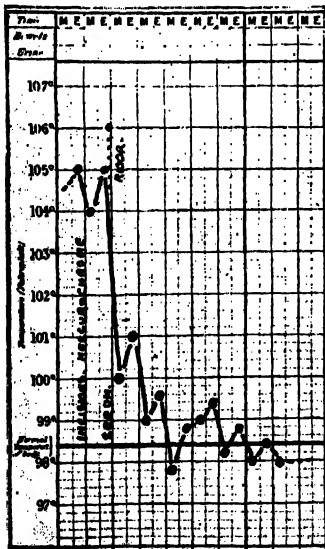


Fig. 34.—From a man of 22 with streptococcal cellulitis of the arm. No response after operation and mercuriochrome. Cured with anti-scarlatina serum. (By kind permission of the 'Clinical Journal'.)

Further operative measure by way of incisions in the hand or arm down to the deep fascia do little good. General factors must be relied upon to localize the disease and operative interference withheld until pus is localized in the form of abscesses.

Arm-baths and hot fomentations are recommended by Edwards. The reviewer usually applies one dressing daily of 10 per cent **Glycerin and Ichthyol** covered by an extensive stupe and mackintosh. He agrees with Edwards that intravenous antiseptics are as a rule useless. The most powerful remedy at our disposal is specific **Antitoxic Serum**. About 60 c.c. of anti-scarlatina serum given intravenously had a dramatic result in one case cited in this paper (Fig. 34). The case points the way to the treatment of all septicæmic cases. One condition must be obeyed, however—the serum must be specific for the infecting organism. More often than not, such specific sera are not to be obtained. The strains of streptococci are so numerous that it is only by a lucky chance that one of the two sera available—polyvalent antistreptococcal and antiscarlatinal—is specific for the case of the moment. There

is, of course, no time to obtain specific serum from the organism cultured in the individual case. Only by clinical trial is one able to tell whether either of these sera is specific for the case in point, though if a scarlatiniform rash

develops, it is an indication for the use of the anti-scarlatina serum. If there is no evidence after clinical trial that the serum is specific, then no good can come from its use, and it may cause complications, such as serum rash and acute polyarthrititis, if persisted with. It is Edwards's practice, therefore, to give 30 c.c. of the polyvalent serum into the abdominal wall, and await the

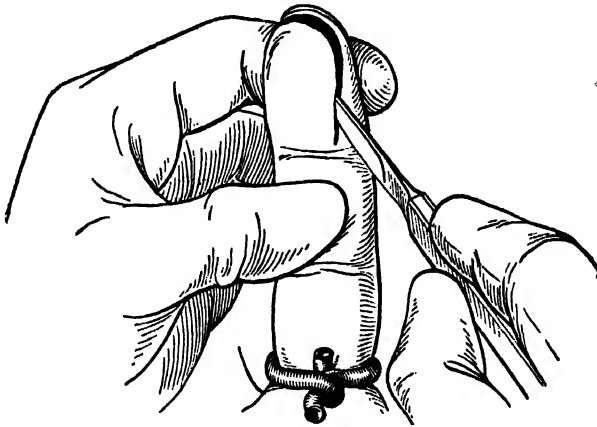
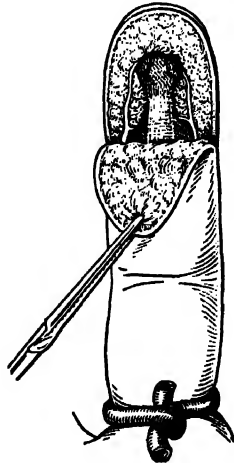


Fig. 35.—Treatment of septic finger. First step. A curved incision is made 3 mm. in front of the nail, the two sides passing obliquely downward and forward; their extremities reach or just pass the border of the phalanx at the level of the flexion crease. Above, the incision goes straight down to the bone; at the sides it is more superficial and does not go beyond the cellular tissue.

result. If there is no rigor and subsequent fall of temperature, he tries a similar dose of anti-scarlatina serum, and if this is negative in its result, makes no further attempt at serum therapy. If, on the other hand, a good result is obtained, a further dose is given immediately, and repeated each day until the temperature has reached normal.

Fig. 36.—Second step. The palmar flap, containing the greater part of the cellular tissue of the pulp, has been turned down. The dorsal flap includes the terminal phalanx, the end of the flexor tendon and its sheath, which must be identified, and the two collateral nerves.



Morphia should not be withheld from these cases when rest is needed, and **Fluids** should be administered generously by the mouth, by rectum, and, if necessary, continuously into the veins and cellular tissue.

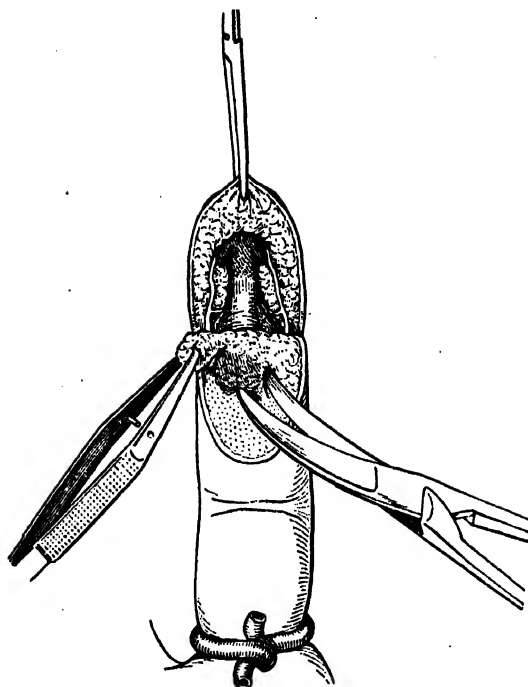
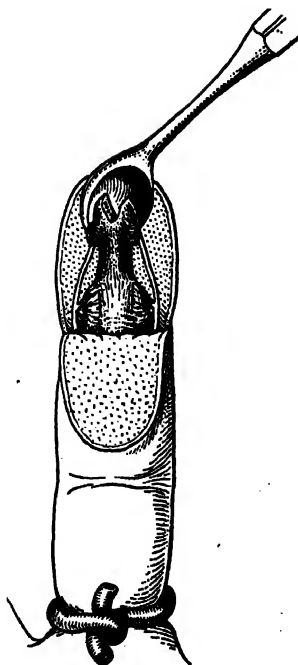


Fig. 37.—Third step. Curved scissors are cutting away the necrosed fatty cellular tissue. In approaching the tendon-sheath they should be directed from the end of the finger towards its base in order to reach right to the sheath without damaging it.

Fig. 38.—Fourth step. The suspected cellular tissue has been removed. The healthy zone reached is shown stippled. A fragment of necrosed phalanx has been resected. The nerves are left intact, especially the dorsal branch supplying the nail-bed.



J. Fraser² deals thoroughly with infections of the hand and fingers and describes the ideal incision for drainage at the common sites of infection.

J. de Rougemont and P. Carcassonne³ discuss the stages of the operation of drainage and bandaging in cases of sepsis involving the pulp of the finger.

Fig. 39.—Fifth step. Two drainage tubes perforated in the middle are placed in the wound between the two flaps.

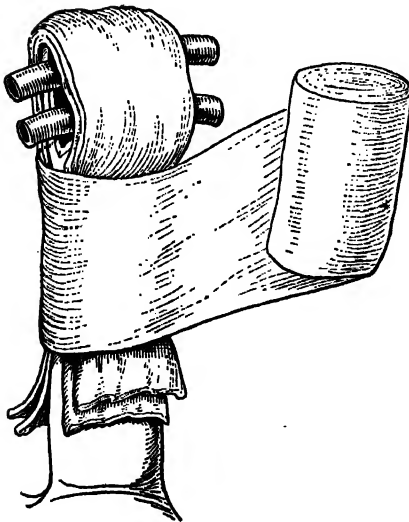
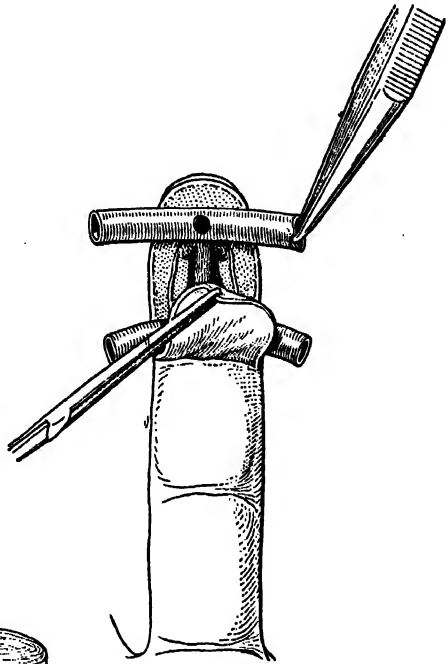


Fig. 40.—Sixth step. The deep dressing. Two folded compresses support the palmar flap and the drainage tubes. A turn of bandage holds all firm. This is covered by a removable superficial dressing. Tube irrigation is carried out. (Figs 35-40 by kind permission of 'La Presse médicale'.)

The accompanying figures (Figs. 35-40) show clearly the steps of the technique they recommend.

REFERENCES.—¹*Clinical Jour.* 1932, June 1, 253' ²*Practitioner*, 1932, July, 18; ³*Presse méd.* 1932, April 23, 627.

HARE-LIP. (See CLEFT PALATE AND HARE-LIP.)

HEAD INJURIES.*Geoffrey Jefferson, M.S., F.R.C.S.*

The management of cranio-cerebral injuries continues to stimulate considerable interest and discussion, indicating that there is no uniform practice in universal favour. A perusal of the American literature in particular impresses the reader with the activity of the neuro-surgical services which have been established at many centres and have taken over the treatment of these cases. Statistical reviews from these sources have been referred to in the issues of the MEDICAL ANNUAL during recent years, and again this year there are more. Some of these surveys are actually of very minor importance in comparison with the labour that they put upon both compiler and reader. For example, for statistical purposes evidences of fracture are very attractive, whilst practically they are of little importance. And occasionally these enthusiastic reports re-discover extremely ancient facts, such as the brittleness of the orbital plates and tegmen tympani—first discovered, according to one author, in 1927. Such blemishes try the patience of the reader. D. H. Werden¹ analyses 1200 cases treated at the Los Angeles General Hospital during the last eighteen months, a remarkably large number of cases in so short a period. This Hospital is doing good work, the studies of Rand in particular on the necropsy material, which is obtained more easily than is the case in this country, being full of interest. All fatal cases come to post-mortem at the coroner's request, so that there is ample opportunity for study. A. Ochsner² concludes his review of these injuries with a section on treatment.

There is also a trenchant article by H. E. Mock,³ in which he pillories most of the pundits for disagreeing with one another on principles of treatment. Taking **Lumbar Puncture** as an example, he quotes Dandy as saying that it has no place in the treatment of cranio-cerebral injury, Loyal Davis is lukewarm, Cushing is opposed to it, as is Sachs, but Bailey frequently uses it, whilst Peet and Jackson and Temple Fay⁴ are enthusiastic. C. C. Coleman⁵ in a thoughtful paper also favours its use. Temple Fay in particular is what we may term an enthusiastic dehydrator, and his régime is as follows: the immediate giving of 50 per cent glucose intravenously, complete spinal drainage (removal of 45 to 100 c.c. of C.S.F.), restriction of fluid intake to 20 to 30 oz. for the first ten days, and 32 oz. for the next three months; a daily lumbar puncture is done, with abstraction of 45 to 60 c.c. of fluid. This treatment is at least logical in its thoroughness, but there is increasing doubt as to whether dehydration is the ideal, and even as to whether it may not cause damage. However, Fay's mortality of 41 cases (18.3 per cent) in 224 cases is not by any means excessive, and when we find that only 8 died from the cerebral injury alone after the third hour of treatment, it is evident that this drastic procedure is more benign than one would anticipate. But Werden in the review mentioned above gives the spinal pressure readings as being increased in 67 cases, and normal in 40, and that, of this latter group, it was normal in 13 of the fatal cases. This does not support the view that all fatalities are due to cerebral compression, and if this is so are we justified in concluding that all the ills that these patients suffer are due to pressure? And if the answer is no—and no other reply can be given—it is illogical to treat them all by dehydration. This problem was discussed by the present writer elsewhere⁶ and will be referred to again in a moment. But first it is necessary to refer in more detail to the pressure problem.

Intracranial Pressure in Head Injuries.—Ritchie Russell⁷ made an analysis of 200 carefully observed cases and gives an admirable account of them. Examination of the cerebrospinal fluid was carried out on 67 occasions in 40 cases. The results are not given in great detail, but the most striking fact was that the pressure was over 200 mm. of water in 12 cases whose mental

state was normal, and in none who were comatose, the highest pressure in the only three of these who were apparently tested being 100 to 200 mm.

These observations lead to the conclusion that high intracranial pressure is not an essential factor in producing the gravity of head injuries. It is not to be denied that high pressure may exist, but not always, and it is scarcely likely, therefore, to be the dominant factor that makes for the difference between recovery and death. Yet it has come to be accepted that all head injuries have cerebral compression and that the whole aim of treatment is to reduce this pressure. Methods of active treatment have largely been based on this view. A hundred and fifty years ago, operation was advised with the idea of preventing infection (Pott). It was revived 125 years later to prevent compression, and surgeons were advised to perform uni- or bi-lateral decompression. The newer and certainly more efficacious method of intravenous hypertonic therapy and lumbar puncture drainage is directed to the same end. The risk is that in this method we have a very potent weapon, more powerful if more transient in its effect than decompression, and we have to learn just how to use it. It is easy enough to see how the belief of compression as a cause of lasting unconsciousness has come about. It is undeniable that compression may cause unconsciousness; the classical picture of middle-meningeal hemorrhage—primary unconsciousness from concussion, lucid interval, and then clot compression with stupor—is a convincing acute human experiment. The coma of cerebral compression from other causes confirms the fact. But we should be wrong, and we are indeed wrong, when we assume that compression is the dominant cause of stupor in all head injuries. The plain fact is that definite, demonstrable neural damage is the common cause of the symptoms of head injury (excluding perhaps classical pure concussion), and the most potent cause of death. Edema may contribute to death, and calls for treatment, but we ought to treat it, and treat compression, only when we know it is present. The conclusion is that energetic treatment to this end should only be undertaken when we have manometric proof of the presence of a dangerous rise in pressure. There have been fatalities after therapeutic use of lumbar puncture in the first hours after head injury, and there has been at least one fatality after the precocious use of intravenous glucose. The best plan is to treat the patient primarily for shock, and to apply other methods of treatment in accordance with the observed facts of the case. These methods take the shape of diagnostic lumbar punctures with pressure readings, intravenous therapy when called for, and operation for hemorrhages either extra- or intradural. There is little doubt that **Intravenous Therapy** is a safer method of treatment than lumbar drainage, as it recalls the fluid into the circulation evenly. A retention enema of 4 oz. of 50 per cent **Magnesium Sulphate** may be used as a routine, as it is not powerful enough to lower dangerously an intracranial pressure which maybe does not need lowering.

In the writer's view **Dehydration** has a greater place in the treatment of head injuries after the first twenty-four hours, for it is not a life-saving measure. It certainly fails to recall the stuporous patient back to consciousness, which demonstrates convincingly enough that this state is due to parenchymal damage and not to the waterlogging of otherwise normal tissues. But in the stages of recovery dehydration certainly has a place and a value, particularly in restless patients and in those with severe headache, evidences of which can be made out even in those who have imperfectly regained consciousness.

The judicious use of **Morphia** to prevent exhaustion is most helpful, provided, as Russell says, that the effects of one dose be allowed to wear off before another is given, so that a check can be kept on progress.

As for **Operation**, we reserve it for cases in which the neurological signs point to local clot compression. Localizing signs of injury are far more often present than the average surgeon imagines and do not always indicate compression. They may arise from local contusion, especially in children, whose more elastic skulls readily allow local indentation. It is in the differentiation of contusions from compressions that some of the most interesting work arises.

Chronic Subdural Hæmatoma.—As just mentioned, hæmorrhages are always an indication for **Operation**. It must not be forgotten, however, that in children a localizing sign, especially a monoplegia as opposed to a hemiplegia, very possibly indicates a cleanly localized cortical contusion rather than a clot. A focal sign of this nature, and especially a more widely spread paresis, occurring in an adult, usually means a hæmorrhage. Although the American writers cite the paper of Putnam and Cushing in 1925 as bringing the matter to the attention of the medical public, they must obviously be speaking of their own country, for several valuable papers had appeared in England prior to this, notably Trotter's (1914) and Bowen's (1905). Rand's and Jelsma's excellent papers were referred to in the *MEDICAL ANNUAL*, of 1929 (p. 218).

A further important contribution has been made by H. W. Fleming and O. W. Jones,⁸ recording eight further cases. These illustrate a very important point, namely, the tendency of these hæmorrhages to lie bilaterally (a fact that the English writers insisted upon), making it important to evacuate the blood from both sides. They state that their patients were usually young adults; but actually five of the eight cases were 40 years of age and upwards. The subdural hæmorrhage followed injuries which were often not severe, and the onset of symptoms varied from a few days to many months (for example, 30 days, 6 weeks, 3 months, 11 days, etc.). The clinical picture did not follow any stereotyped pattern and was often puzzling, sometimes suggesting a post-traumatic psychosis. The one constant factor was that a man, at some variable period after an injury, was admitted to hospital with severe headache, with some weakness of one or the other side of the body; but as the patient was often in semi-stupor it was only by close observation that differences in limb movements could be discovered. Papilloedema was usually present and the spinal fluid pressure definitely raised. X rays were commonly negative for fracture. In four of the eight cases bilateral clots were found, but as the contents were always fluid their evacuation was a simple matter, and all patients save one recovered.

The method employed by Fleming and Jones has the merit of simplicity. It consists in the boring of four small holes in the skull, two for each side of the head. The anterior opening is made just in front of the coronal suture, the posterior towards the hinder end of the parietal eminence. A crucial incision is made in the dura and the endothelial capsule (which is always present) of the clot is torn through and its dark fluid contents evacuated. The cavity is then gently irrigated with Ringer's solution. It is often possible to see by the colour of the dura that a clot is present beneath it, an encouraging sight, for these cases do well.

This simple method of boring small holes without the trauma of an osteoplastic flap commends itself, and appears to give results which cannot be bettered by larger exposures.

(See also articles SUBDURAL HÆMATOMA, CHRONIC; SUBDURAL HÆMATOMA IN INFANTS.)

REFERENCES.—¹*Calif. and Western Med.* 1932, Oct.; ²*Amer. Jour. Surg.* 1931, June, 523; ³*Jour. Amer. Med. Assoc.* 1931, Nov.; ⁴*Surg. Gynecol. and Obst.* 1932, Feb., 362; ⁵*Jour. Amer. Med. Assoc.* 1931, ii, 1696; ⁶*Proc. Roy. Soc. Med.* 1932, March, 742; ⁷*Amer. Jour. Surg.* 1931, June, 751; ⁸*Surg. Gynecol. and Obst.* 1932, Jan., 81.

HEART. (See also ANGINA PECTORIS AND CARDIAC PAIN; ARRHYTHMIA AND ELECTROCARDIOGRAPHY; CARDIOVASCULAR SYPHILIS; MYOCARDIUM, DISEASE OF.)

HEART FAILURE.

A. G. Gibson, M.D., F.R.C.P.

In a series of articles dealing with *congestive heart failure* by T. R. Harrison, J. A. Calhoun, and F. C. Turley,¹ the action of **Digitalis** is considered in the various types of cardiac failure met with in practice. The authors exclude from their consideration its value in auricular fibrillation, upon which all authors are agreed. They refer to James Mackenzie's statement in 1925 that digitalis occasionally has a good effect in patients with a regular rhythm. The experiments of the authors concerned 43 patients, and the drug was administered in the form of capsules or tablets of the powdered leaf, most frequently in doses of 9 gr. (0.6 grm.) daily for three days, followed by 3 gr. (0.2 grm.) daily for an indefinite period thereafter. They point out that Marvin in 1927 in well-controlled experiments showed that digitalis was most effective in regular rhythm with œdema when the failure was due to arteriosclerotic heart disease, and was to some extent effective in rheumatic and syphilitic disease. Of 19 patients who suffered from paroxysmal nocturnal dyspnoea (cardiac asthma) without œdema, 16 were completely relieved, 2 partially, and 1 was made worse. All 43 patients had a diminished cardiac reserve as estimated by dyspnoea on exertion, but without other signs of congestive failure. Clear benefit was obtained in 15, apparent benefit in 14, no improvement was seen in 12, and 2 were made worse. It is to be concluded, therefore, that all patients with congestive cardiac failure, even in the early stage of diminished cardiac reserve, should be given full doses of digitalis, which should be continued indefinitely unless the symptoms are made worse.

B. E. Hamilton² discusses the advantages of the *local treatment of œdema in congestive heart failure*. Aspiration of hydrothorax is usually safe, and but rarely followed by unpleasant symptoms, such as irritative cough and œdema of the lungs. Sudden death has been recorded in this procedure, but this fact should not deter the physician in charge from removing the fluid. As a rule there is some relief of the dyspnoea. The author uses a dose of **Codeine** before removal to prevent unpleasant symptoms of cough.

Ascites is rarely great enough to cause tension in the abdomen and pressure symptoms. In regard to **Massage**, bandaging and pressure may cause the disappearance of slight œdema or make a hard œdema softer, and may add to the comfort of the patient. One startling example of the value of massage is recorded in a man aged 78 with hypertensive cardiac failure and gross œdema to the level of the navel. Vigorous massage for fifteen minutes three times each day caused marked diuresis, which ceased as soon as the massage was interrupted. As a local measure Hamilton recommends Carnot's method of a dressing of a solution of **Salt and Glycerin** applied to the œdematous leg. He is not against **Longitudinal Incisions** in the upper and outer surface of the thigh for the drainage of œdema, as recommended by Sépét. **Southey's Tubes** have still a value in the removal of œdema. They may be left in place for as long as thirty-six to forty-eight hours.

H. R. Miller and A. Feldman³ have used massive doses of **Urea** in the treatment of cardiac dropsy. The diuretic properties of urea do not weaken during months or even years of almost uninterrupted use, and no deleterious effects are demonstrable on the patients. No special diet is used, and the dose of urea is from 10 to 25 grm. as a 40 per cent water solution twice or three times a day.

As a rule 18 grm. were sufficient, and after satisfactory diuresis has been obtained the dose may be lessened to the least amount that will produce

and maintain the required excretion. To the necessary amount of 40 per cent solution the authors have added the juice of a pressed lemon, beer, or uncooked tomato juice in order to lessen the unpalatability. In some of the patients so treated the efficiency of the circulation has been restored and maintained for a considerable time. Patients both with or without auricular fibrillation reacted to the treatment. Some patients remained under continuous treatment for as long as three years. The treatment does not impair the function of the kidneys or alter their structure. It is a valuable drug in preventing the recurrence of œdema in cardiac failure.

REFERENCES.—¹*Arch. of Internal Med.* 1931, Dec., 1203; ²*New Eng. Jour. Med.* 1932, June 23, 1290; ³*Arch of Internal Med.* 1932, June, 964.

HEART IN GOITRE. (See also ARRHYTHMIA.)

A. G. Gibson, M.D., F.R.C.P.

J. Parkinson and H. Cookson¹ have made an investigation of 130 patients with goitre causing symptoms in order to ascertain whether the heart was enlarged. They have also examined the post-mortem records of 43 goitre cases. Of the post-mortem series hypertrophy was found to be present in rather more than half. It involved both ventricles, and right-sided hypertrophy alone was not seen. The weight was greater in those cases with established fibrillation, and the largest weight was in those with fibrillation and heart failure. In great emaciation the heart was slightly if at all hypertrophied. The authors conclude that clinically cardiac enlargement is difficult to be certain of, and requires an X-ray examination made by orthodiagraphy or by a photographic record taken with the film at a distance of six feet from the tube. In about 45 per cent there was slight or moderate enlargement as estimated by the total transverse diameter and the oblique or long diameter. The paper itself should be consulted for the details of the method of estimation. Electrocardiograms so far as they could be used as an indication of hypertrophy confirmed the X-ray and post-mortem findings. In a few patients with permanent fibrillation serial records showed a progressive increase in the size of the heart. The outline of the heart is often characteristic. There is an undue prominence of the pulmonary arc which can be identified earlier than any enlargement of the chambers. The left auricle is not enlarged out of proportion, and in this respect it is sharply in contrast with the condition found in mitral stenosis. When symptoms are of mild degree or of short duration the heart is normal in size and shape, but tends to become modified with severity or lapse of time, especially in auricular fibrillation and cardiac failure. Radiological examination, however, is a help in judging the presence or severity of a cardiac lesion, and a demonstration of cardiac enlargement is important from the point of surgical treatment, enlargement being an indication for, rather than a contra-indication to, surgical treatment.

REFERENCE.—¹*Quart. Jour. Med.* 1931, July, 499.

HEART IN PREGNANCY. (See also PREGNANCY AND ITS COMPLICATIONS.)

A. G. Gibson, M.D., F.R.C.P.

A. R. Gilchrist,¹ discussing heart disease in relation to pregnancy, divides the cases into four categories: (1) Those in which there are no symptoms and the condition is discovered accidentally. (2) Those who are able to perform their usual activities but have some discomfort. In these pregnancy and labour usually offer no difficulty, though forceps may be required in the second stage if prolonged. In this group are also included those patients who have marked limitation of physical activity. (2b) These are unable to perform ordinary everyday exertion without showing some signs of distress, such as shortness of

breath or palpitation. These patients require treatment for the cardiac condition, and depending on its effect the majority may be found fit enough for a natural labour. (8) Those whose cardiac reserve is minimal. They are able to do no household work and to walk only a few yards with difficulty. In these patients the least additional strain at labour will overburden the heart and may precipitate a fatal issue either immediately or in the early days of the puerperium. It is in these cases that antenatal care can do so much to avoid a catastrophe even in the most desperate. If up to the third or fourth month the patient is classified as belonging to 2b or 3, pregnancy should be terminated when the heart has been brought into as good a condition as possible. If the patient is graded as 2b at or about the fifth month, **Cæsarean Section** may be done at or about term, or, exceptionally, a natural delivery may be allowed.

REFERENCE.—¹*Edin. Med. Jour.* 1931, Sept., 121.

HEART, SURGERY OF.

Sir W. I. de C. Wheeler, F.R.C.S.J.

E. C. Cutler¹ divides this subject into: (1) Treatment of injuries to the heart; (2) Treatment of acute and chronic pericarditis; (3) Treatment of angina pectoris; (4) Treatment of mitral stenosis. Few surgeons have any experience in the treatment of these conditions. The reviewer has once removed a bullet embedded in the myocardium, but as in cases of pulmonary embolus, unless the heart can be surgically exposed almost immediately after a severe injury, death is certain to result. Many cases have been recorded, and have been mentioned in various issues of the *MEDICAL ANNUAL*, in which bleeding from the heart after a wound has filled the pericardium and embarrassed the heart's action. In opening the pericardium there is an alarming gush of blood, but the heart's action is at once restored. The wounded heart is then sutured. Cutler mentions such cases and states that a wound of the heart due to a small pointed instrument such as killed the Empress Elizabeth of Austria in 1898 becomes a serious condition because of the mounting intra-pericardial pressure. Cutler recommends the use of a stitch in the apex of the heart to deliver and hold the organ, and a finger on the opening to stay the loss of blood while control mattress sutures are introduced. Tuffier, in 1920, compiled a total of 305 cases with 50·4 per cent recoveries. Statistics mentioned by Cutler record 78·6 recoveries.

In discussing surgical drainage of acute pericarditis it is recommended to drain but not to use any irrigating solutions other than physiological salt. The real problem is the difficulty of making a diagnosis. In 150 cases at the Boston City Hospital the diagnosis was made in only 17 per cent of the proved cases. Brauer, in 1902, led the arguments in favour of removing overlying ribs which were impeding free cardiac motion in chronic cases. In cases where there are marked cardio-pericardial adhesions Cutler states that the operation of decorication of the heart is now an accepted procedure. He says: "We have had the opportunity to see the brilliant results occurring from pericardiectomy—a bedridden, orthopnoëic, waterlogged boy of 14 years restored to an active life. As I look back upon my short experience in medicine this case is to-day one of the most outstanding examples of the restorative powers of intelligent surgery."

A. M. Shipley² deals also with the surgery of the heart and pericardium. The line of incision in exposing the heart and pericardium extends in the fourth interspace from the anterior axillary line to the margin of the sternum. The sternal attachments of the third, fourth, fifth, and sixth cartilages are exposed, and as many of them separated from the sternum as is necessary.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1932, Feb., 274; *Ibid.* 280.

HEART, VALVULAR DISEASE OF. A. G. Gibson, M.D., F.R.C.P.

M. Campbell and J. W. Shackle,¹ in a note on *aortic valvular disease*, find that in a series of 291 cases the condition was due to rheumatism in 200, to syphilis in 55, to atheroma in 20, and to all other causes in 21. Out of every 6 rheumatic cases, 3 had mitral stenosis as well as aortic incompetence, and 1 had aortic stenosis as well as aortic incompetence and mitral stenosis. Apart from those with mitral disease, there were 2 men for each woman. With mitral disease there were 2 men for every 3 women. Amongst the syphilitic cases there were 3 men for each woman, and four-fifths of the patients were between 40 and 60 years of age. The pulse-pressure in the rheumatic cases was greater than that in the syphilitic cases. Nearly all the atheromatous cases were men between 50 and 80. In these cases aortic stenosis was the more important lesion and was sometimes present with regurgitation.

H. A. Christian² describes a form of aortic stenosis which has a characteristic clinical picture and which ought to be diagnosed more commonly than it is. It occurs in males late in life; the lesion is slow and progressive with the ultimate appearance of cardiac insufficiency. There is a harsh murmur and thrill, both systolic in time, over the aortic area, sometimes accompanied by a diastolic aortic murmur, best heard down the left side of the sternum. There is great hypertrophy of the heart and a diminished pulse-pressure. In the greater number of the author's 21 cases there was no rise in blood-pressure.

Post mortem the heart is large, hypertrophied, and frequently dilated. The aortic cusps are encrusted with calcified excrescences which effectively and permanently narrow the aortic orifice. The process is of very slow development, during the greater part of which patients suffer no gross cardiac symptoms. Ultimately they complain of symptoms of myocardial insufficiency, and when these have developed, the author's experience is that the patients do not live long. The rhythm of the heart is regular in the majority of cases.

The author believes that the etiology is often rheumatic. Eleven of 21 cases verified at post-mortem had a history of rheumatic fever from thirteen to forty-eight years previous to the onset of symptoms of cardiac insufficiency. Two of the author's cases had had syphilis, but the lesion in no way resembles syphilis of the valves. Besides the usual clinical signs of aortic stenosis mentioned above, the calcification of the valves can be demonstrated by X rays.

W. D. Reid and G. E. Levene³ examine the question of *X-ray diagnosis of mitral disease*. They have used a series of measurements of the cardiac silhouette, two of which, put as a fraction, give the auricular-ventricular ratio, which varies according to the proportion of the auricular to the ventricular parts of the heart. The ratio, which is normally 0.5 to 0.7, increases in mitral stenosis, with enlargement of the auricles. The ratio would appear to be a help both in the finer diagnosis of difficult cardiac conditions and in providing accurate information of the changes in the course of mitral disease under treatment.

REFERENCES.—¹*Brit. Med. Jour.* 1932, 1, 328; ²*Jour. Amer. Med. Assoc.* 1931, July 18, 158; ³*New Eng. Jour. Med.* 1932, May 19, 1027.

HEART-BLOCK. (See ARRHYTHMIA.)**HEAT CRAMP.**

G. E. Oates, M.D., M.R.C.P., D.P.H.

This condition, which might equally well be called 'water-poisoning', has been elucidated by the activities of British physiologists, notably J. B. S. Haldane and A. V. Hill. It was until recently an important cause of disability in all industries where work proceeds under strenuous conditions and in overheated surroundings.

E. M. Brockbank¹ records a case of miner's cramp, which complaint is still

not uncommon although seldom recorded. The cramp would begin suddenly in the fingers and toes (in tetaniform manner), increasing in severity and gradually ascending the limbs to the back and neck. The cramp in the trunk and limbs lasted a few minutes, then eased somewhat in the limbs, but the hands and feet still remained more or less contracted and would continue so for three or four days. The patient would then feel well enough to return to work, although not in his former vigour. The pain was sometimes so severe as to cause vomiting. There were six or seven attacks within a period of two years. He worked in a very hot mine and was accustomed to perspire freely. During twenty-four hours he consumed perhaps $8\frac{1}{2}$ pints of water, tea, and beer. He took no salt except with his food, and had no particular desire for salt food as some miners have who suffer from cramp. He was of low stature and poor physique.

Heat cramp also occurs amongst stokers and firemen, and D. M. Glover² describes the conditions as it occurs in the steel-rolling industry. In profuse sweating as much as 1 oz. of salt may be excreted in the sweat—twice as much as the ordinary man consumes in all forms per day. If such a serious salt excretion is followed by the drinking of large quantities of water during muscular exertion, the diversion of blood from the kidneys to the muscles and skin may be so great that the excess of water cannot be excreted through the kidneys and the body fluids become deficient in salt concentration. The sufferers are usually men of poor physique, and the muscles affected by spasmodic contraction are those which are most in use. The urine is of course scanty and almost free from chlorides at the time of the attack.

C. P. McCord and T. L. Ferenbaugh³ discuss fatigue occurring in soldiers from chlorine losses. They suggest that the use of 0.5 per cent **Sodium Chloride** as a drink instead of water would tend to lessen fatigue in soldiers on the march and to prevent cramps. It is now usual to supply workers whose work causes excessive sweating with water containing 10 gr. of sodium chloride to a gallon, with beneficial results. In some cases tablets of sodium chloride are issued to the workers for use.

Finally, the possibility of exhaustion and cramps occurring in 'hikers' and sun-bathers and due to chloride deprivation must not be overlooked. The remedy is simple and effective.

REFERENCES.—¹*Lancet*, 1929, i, 65; ²*Jour. of Indust. Hyg.* 1931, 347; ³*Milit. Surgeon*, 1931, 608.

Macdonald Critchley, M.D., F.R.C.P.

It has long been known that workers whose occupation necessitates exposure to extremes of heat are liable to various distressing symptoms. Certain of these manifestations have been attributed by L. C. Johnson,¹ R. R. Sayers, and Harrington and others to heat exhaustion; to this category belong malaise, depression, asthenia, headache, vertigo, nausea, vomiting, diarrhoea, thirst, and restlessness. More serious symptoms, such as hyperpyrexia and epileptiform attacks, are rare in industrial environments. Of especial interest is the occurrence of severe painful cramps in the muscles of the trunk and extremities, which may be attended by considerable collapse. These are sometimes spoken of as 'miner's cramps', 'heat cramps', or 'the bends'; they are apt to occur—with or without the other manifestations of heat exhaustion—in steelworkers, stokers, ship's firemen, workers in iron foundries, and others whose occupation entails hard physical exertion under circumstances of intense heat. Apparently the first description of heat cramps was given by W. M. L. Coplin, D. Bevan, and H. Sommer, jun.,² who described them in employees at a sugar refinery. The theory was originally held that they were due to the drinking of ice-cold water, but prophylactic measures along these lines failed to

reduce the incidence of cramp. J. S. Haldane³ attributed the symptoms, however, to acute water-poisoning, that is, replacement by water of the saline lost from excessive sweating, and suggested the administration of **Sodium Chloride** as a preventive measure. K. N. Moss⁴ found that a thoroughly acclimatized miner, working in an experimental hot chamber, lost as much as 6½ lb. of salt in an hour; he therefore recommended the use of **Salt Water** (6 grm. NaCl + 4 grm. KCl to one gallon) instead of fresh, and the results were very encouraging. It is noteworthy that for some years salt solutions had been used empirically for heat cramps. Glover deals with the results of chloride administration among workers of the Oris Steel Company and the U. S. Aluminium Company of Cleveland; they found the employees frequently reluctant to drink the salt water, owing to the unpleasant taste, and he therefore used compressed tablets of NaCl, each one containing 16 gr. Little automatic dispensing machines were made, and the workman swallows a tablet each time he takes a draught of water. This performance may occur two or three times an hour, but no ill-effects of any kind have been noted.

REFERENCES.—¹Art. "Heat Exhaustion," Tico's *Practice of Medicine*, 1921, vi, 381; ²*Med. News*, 1892, lxi, 262; ³*Brit. Med. Jour.* 1928, i, 609; ⁴*Proc. Roy. Soc. (Series B)*, 1923-4, xcv, 181.

HERNIA.

A. Rendle Short, M.D., F.R.C.S.

Ever since the word 'rupture' was used to denote hernia, writes J. J. Moorhead¹ (New York), there has been a widespread opinion that trauma is the responsible factor in its causation. Accepting as he does the theory that there is always a preformed peritoneal pouch, he maintains that an isolated or single injury is never the cause of inguinal hernia, and aggravation by trauma is exceedingly rare. When it does occur there will be immediate local symptoms, and operation will show exudate, hæmatoma, or recent adhesions.

Injection Treatment.—We have previously referred to this subject and given details (*MEDICAL ANNUAL*, 1931, p. 238, and 1932, p. 230). Ignatz Mayer² (Detroit) contributes another article on his thirty years' experience of it. The formula of his injection fluid is:—

Zinci Sulphatis	1 dr.
Phenol Crystals	6 dr.
Glycerini	4 fl. dr.
Aq. Cinnamomi	1 fl. oz.
Fl. Ext. Pini Canadensis (dark) ..	5 fl. dr.
Sterilized Redistilled Water	2 fl. oz.

The dose is ½ c.c. for the first injection, and 1 c.c. afterwards. [In our experience this formula does not make up well in these proportions, but forms a satisfactory solution when diluted with an equal quantity of water. —A. R. S.]

It ought not to be used when the hernia is irreducible. Many injections may be needed, and a truss must be worn night and day until the sac is obliterated. De Lisle Gray³ has been using the method at Brighton. He describes the technique as follows: If the external ring is large enough, the skin of the scrotum is invaginated with the middle finger (for choice) of the left hand and the external oblique lifted up. The needle (No. 17 'Summit'), mounted on the charged syringe, is inserted vertically over the site of the internal ring till the point is felt to pierce the aponeurosis. The piston is withdrawn to ensure that no vessel has been entered. The contents of the syringe are slowly injected, withdrawing the piston after every few drops to make certain that the point of the needle is still outside any vessel. It is often impossible with a small hernia to lift the external oblique as suggested above;

in these cases the needle may be inserted through the external ring into the inguinal canal either above or below the cord, which is identified and held out of the way, or the neighbourhood of the internal ring may be reached by inserting the needle vertically to the skin at a point just above Poupart's ligament and immediately external to the termination of the external iliac artery, identified by palpation. The patient must lie quite still, and the truss is to be put on and taken off by the surgeon. From ten to twenty-five injections may be necessary. A hard mass forms in the inguinal canal, which can be felt with the needle; when the canal seems full, the injections are stopped, and after a few weeks the truss is removed and the patient coughs. If no hernia comes down the truss is worn another month, then left off, except during strenuous exertion. The method is not recommended for children. Gray reports 25 cases, of which 18 were cured.

Technique of Operation.—As usual, plenty of new methods, or variations of old methods, appear in the year's literature. The Germans are still very interested in the Schmieden technique, which we described and illustrated in the *MEDICAL ANNUAL* for 1931 (p. 239). Three suggestions are perhaps worthy of being put before our readers. Capt. Guimy,⁴ an army surgeon at Namur, after cutting away the sac of an inguinal hernia, passes four bronze wires through skin—Poupart's ligament—transversalis and internal oblique muscles—external oblique aponeurosis—skin, leaving the spermatic cord in the depth of the wound, and ties the wires over a roll of gauze laid along the inner side of the incision. The wires remain in ten days. He says there is no recurrence, no hæmatoma, and the patient can get up the day after the operation.

E. M. Hodgkins⁵ believes that a recurrence gets a start at the site of tying off the sac. He therefore grasps the ligatured stump with forceps and brings it out through a small hole torn in the internal oblique muscle as far out towards the anterior superior iliac spine as possible; it is fixed there by stitching to the deep surface of the external oblique aponeurosis. [But the majority of recurrences are direct.—A. R. S.]

Major P. Bannerjee⁶ (Calcutta) operates as a routine for inguinal hernia not from the groin but by an intraperitoneal route, to save damage to the inguinal canal and the spermatic cord. He is a believer in the preformed sac or dimple theory of the causation of hernia. With the patient in the Trendelenburg position the sac is located and any omentum or bowel pulled out, the peritoneum a quarter of an inch around the sac is picked up with forceps and brought together over it by a suture. The loose peritoneum lining the fossa is then pulled up as a fold in a line parallel to Poupart's ligament and immediately behind it, and is sewn on to the abdominal wall above the level of the hernial opening and covering the earlier suture. Thus four folds of peritoneum cover the hernial orifice, and all loose peritoneum is tightened up. Both sides can be done at once. Children are not suitable. The author reports 66 cases (3 were recurrent) followed 6 months to 3½ years, with no relapses.

Statistics.—H. Ledermann⁷ has followed up 416 cases operated on for inguinal hernia, and finds only 3·3 per cent of recurrences. The usual method of operating was Hachenbruch's, in which only the aponeurosis of the external oblique is used for closing the inguinal canal, leaving the spermatic cord lying between two flaps of the aponeurosis. Their experience with the Bassini operation had been abnormally bad.

Strangulated Hernia.—A collective investigation into the results in 1487 cases of strangulated hernia made by C. Frankau⁸ shows a mortality for inguinal hernia of 12·6 per cent, femoral 12·9, and umbilical 41·1. Of 105 cases in which bowel had to be resected, 45 died. There were pulmonary

complications in 115 cases (10 were embolism), of which 48 died. When stercoraceous vomiting was reported, 20 out of 60 died.

Interparietal (Interstifial) Hernia.—W. E. Lower and H. F. Hicken⁹ give a warning that this condition may readily be overlooked. There may be attacks of severe pain in the groin, and even strangulation, but the patient denies that he or she has a hernia, and the local signs may be slight. Usually, of course, the patient has an undescended testis, but not always. Lord Moynihan recommends a combined abdomino-inguinal approach, as the gut is less likely to be cut into.

Femoral Hernia.—K. O. Peters¹⁰ (Vienna) followed up the results of 106 cases of femoral hernia operated on by the Lotheisen (inguinal) method; 98.5 per cent were successful. On the other hand, E. Husted¹¹ (Copenhagen) reports from 21 to 32 per cent recurrences when Poupart's ligament was sewn down to the pectineus muscle or the periosteum of the pubic bone.

Umbilical Hernia.—Paul Laroque¹² uses two pieces of fascia lata, each 4 in. long and 1½ in. wide, sewn into the layers of the anterior abdominal wall crosswise, to close the gap.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, May, 1785; ²*Med. Jour. and Record*, 1932, March, 275; ³*Brit. Med. Jour.* 1932, ii, 12; ⁴*Arch. méd. belge*, 1932, June, 377; ⁵*New Eng. Jour. Med.* 1932, June, 1249; ⁶*Surg. Gynecol. and Obst.* 1932, April, 706; ⁷*Deut. Zeits. f. Chir.* 1932, April, 658; ⁸*Brit. Jour. Surg.* 1931, Oct., 176; ⁹*Ann. of Surg.* 1931, Dec., 1070; ¹⁰*Arch. f. klin. Chir.*, 1932, March, 518; ¹¹*Zentralb. f. Chir.* 1932, June, 1465; ¹²*Amer. Jour. Surg.* 1932, March, 230.

HERNIA, DIAPHRAGMATIC.

A. Rendle Short, M.D., F.R.C.S.

Philemon E. Truesdale¹ gives an excellent account of this condition, of which probably most men of experience have seen an example or two, and, likely enough, failed to recognize it. The symptoms of hernia of the diaphragm are odd because of their variety and complexity. Resembling those of so many other affections, they readily admit of erroneous interpretation. So fantastic are the chest symptoms and physical signs that a competent internist interpreted his observations in one case as moderately advanced pulmonary tuberculosis; by others, the attacks of cyanosis were thought to be due to heart disease and the cough to bronchitis. In another case the prevailing pre-operative opinion was indigestion, obstinate constipation, and later, acute obstruction, probably intussusception. In a third the attacks of cough and cyanosis were attributed to pertussis. In a fourth gastro-intestinal upsets were thought to be due to dietary errors. In a fifth the last physician called, one of six, alone suggested a Roentgen-ray study. This evidence is indicative of failure to consider the possible presence of hernia of the diaphragm from the history and physical examination. In one case, for example, the patient was found in a tuberculosis sanitarium: she had been sent there by examiners in one of the State Clinics.

In adults the clinical picture of diaphragmatic hernia is often so bizarre and bears resemblance so closely to the symptoms of other diseases of the heart, lungs, stomach, gall-bladder, and intestines that this deformity is not among the examiner's thoughts when he makes the diagnosis by elimination. In infants cyanosis is so often a manifestation of enlarged thymus or congenital heart disease that any other cause is seldom considered. Yet cyanosis is an invariable accompaniment of congenital hernia of the diaphragm and differs clinically from that due to enlarged thymus and heart disease. It is less constant, occurs in attacks, is more likely to appear with crying spells, and is promptly relieved by passing a stomach tube or by changing the patient's posture from the recumbent to the erect. The cough associated with congenital hernia of the diaphragm is peculiar. It may be mistaken for

bronchitis, pneumonia, or whooping-cough. It is usually unproductive. When it comes on in paroxysms, it seldom ends with vomiting, is invariably relieved by putting the patient upright, and lacks the characteristic 'whoop' of pertussis.

The physical signs may be as fantastic as the symptoms; dullness at one base, with râles, suggests pneumonia, but the signs vary from day to day according as the stomach is full or empty. Pleuritic effusion is closely mimicked in other cases, or pneumothorax. The chest on that side is bulged and moves badly. The heart may be displaced. The X-ray examination, after barium, usually solves the problem.

Further points are mentioned by Carl Hedblom² (Chicago). Many cases, of course, die in infancy. Strangulation often occurs.

Of 476 operated collected cases: 55 were congenital, of which 36 per cent were obstructed; 64 were acquired, of which 15·6 per cent were obstructed; 145 followed war wounds, of which 47·5 per cent were obstructed; 180 followed civilian wounds, mostly stab or blunt trauma, of which 20 per cent were obstructed.

The treatment should as a rule be surgical. In the presence of an acute obstruction, the first step will be a cæcostomy or colostomy. It is very helpful to have the phrenic nerve blocked; this may be done beforehand, or the nerve may be picked up on the pericardium during the operation, and put out of action by novocain (*Plate XVI*). If the hernia is small, this is not necessary. Reduction and repair may be carried out by laparotomy, by thoracotomy, or by a combination, but the last carries a high mortality. At a laparotomy it is often impossible to reduce (15 per cent) or to suture (17 per cent) the hernia. On paper laparotomy is more dangerous than thoracotomy, carrying a mortality of 35 per cent in 246 cases, as against 19·7 per cent in 132 cases, but that is due to the large proportion of obstructed patients operated on from below. The combined operation (89 cases) carried a mortality of 31·4 per cent. If strangulation is present and there is doubt as to the cause, of course the approach will be abdominal. Small parasternal or para-oesophageal hernias are best dealt with from below. In recent traumatic cases the route should be thoracic (*Plate XVII*), and also in large chronic hernias. A positive-pressure anaesthesia (gas-oxygen-ether) is necessary, and for a thoracotomy the patient should be in a sitting or semi-sitting position (*Plate XVIII*). It is important to have complete muscular relaxation or reduction will be very difficult. After reduction sew up the diaphragm with silk. One or two of the chest-wall sutures should grip a rib above and below. Give CO₂ inhalations at the end, to expand the lung. Truesdale has operated on 12 cases with only 1 death. Three recurred.

REFERENCES.—¹*Ann. of Surg.* 1931, Oct., 528; ²*Ibid.* 776.

A. Tudor Edwards, M.Ch., F.R.C.S.

The recognition of diaphragmatic hernia as a clinical entity, and the more frequent routine examination of patients with symptoms referable to the upper abdomen, has caused an increasing number of cases of diaphragmatic hernia to be reported in the literature. The most extensive series up to date is that reviewed by S. W. Harrington,¹ who has reported 45 cases with 5 deaths and without recurrence. In his opinion there is no definite symptom-complex, but the condition apparently simulates diseases of the chest and upper abdomen such as cholecystitis, gastric ulcer, cardiospasm, and angina pectoris. The symptoms depend upon the amount of the mechanical interference with the function of the herniated abdominal viscera, with the function of the diaphragm, and the increased intrathoracic pressure which causes impairment of the

respiration and circulation. Harrington classifies these herniæ as congenital, acquired, and traumatic. In his first group death often occurs during infancy, and is associated with developmental defects elsewhere. All cases which occurred after birth are classified in the acquired group, and they are largely the result of herniation at a point of embryological fusion of the diaphragm. The traumatic group naturally follows on direct or indirect injury, and the point of distinction is the absence of a hernial sac in the traumatic and congenital types.

The para-oesophageal herniæ are true herniæ with limiting sacs. The ages of the patients varied from 7 months to 70 years and occurred in almost equal numbers in both sexes.

TREATMENT.—For those patients with mild symptoms conservative treatment is advised, but where the symptoms are increasing progressively or are severe, operative treatment is indicated, and especially where large or small bowel is involved, owing to the danger of intestinal obstruction.

Primary diaphragmatic paralysis is helpful in incarcerated and strangulated herniæ, as it prevents spasm and relaxes the ring and therefore permits closure of the defect without tension. Where major surgical treatment is contra-indicated for various reasons, **Phrenicectomy** may be used as a palliative measure. This operation was the only operation in 7 out of 45 cases. **Radical Operation** by an abdominal approach was done in 36, and by combined thoracic and abdominal approach in 2 cases. Of those cases in which palliative phrenicectomy was done, 1 has died of angina pectoris and the 2 others have obtained partial relief of symptoms. Of the 33 survivors of radical operative procedures, all have received relief of symptoms except for a few minor complaints, and there have been no recurrences.

An interesting point brought out by Harrington is the necessity of reducing weight in some of these patients before operation, as some of them are very obese. It is essential, if the herniated viscera are to be returned to the abdomen, that the excessive fat therein be decreased in order to eliminate the danger associated with the increased pressure their replacement would otherwise entail.

REFERENCE.—*Jour. Thor. Surg.* 1931, Oct., 24.

HERPES ZOSTER.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Zoster and Varicella.—E. Bruusgaard¹ in a very interesting article deals with our knowledge of the relationship between these two conditions. He first accepts the clinical evidence that varicella can follow exposure to a case of zoster and zoster to varicella, but points out that from the clinical and epidemiological aspects the two conditions have several important and entirely different characteristic features, which with our present knowledge can only with difficulty be explained by the assumption of a uniform etiology. Varicella leaves a pronounced immunity, so strong that in spite of the wide distribution of the disease and of its constant occurrence, it falls to the lot of very few to see a second infection. On the other hand, it is by no means seldom that patients who have previously had varicella are attacked by zoster. As zoster is a comparatively rare disease, this occurrence is a relatively frequent one. If varicella and zoster are due to the same causal factor, this is a circumstance not easy to explain. Zoster also usually protects against zoster, but patients who have had zoster may be attacked by varicella. Varicella is a disease of childhood, while zoster occurs rarely in children. It is a disease of adults, reaching its highest incidence at the ages of about 50 and 60 years. At this age varicella is seldom seen. Further, zoster, in contrast with varicella, is only slightly infectious. Though it cannot be doubted from clinical evidence that some etiological relationship exists between zoster and varicella, the

percentage of cases in which infection has occurred is small. Only 197 cases have been collected by Netter in France and her colonies. Bruusgaard calls attention to the view held by some authorities that there may be a special type of zoster, *zoster varicellousus*, which is due to the virus of varicella, but shows that the so-called symptomatic cases of zoster (those, for instance, occurring during the administration of arsenic) may equally give rise to cases of varicella. He believes that it is impossible to establish a special group of *zoster varicellousus*. He refers, without comment, to the observations of Cantor, who had observed the presence of zoster but no varicella in some small Pacific Islands, and also to those of Støren, whose experiences in an isolated district of Norway were similar.

Turning to the experimental investigation of these diseases, the author refers to Netter's complement-fixation experiments. This observer was able to demonstrate complement fixation using both varicella antigen with zoster serum and zoster antigen with varicella serum. Positive results were obtained so frequently as to be regarded as a constant phenomenon. Bruusgaard does not, however, accept this as definite proof of the unity of the two diseases; it may be the expression of a group reaction between two closely related kinds of virus. In theory these results should point to a reciprocal immunity, but this does not agree with clinical experience. Netter also showed that the complement-fixation reaction is not confined to ordinary zoster but occurs also in symptomatic zoster. He therefore concludes that this latter condition is also due to the still undetermined virus of zoster, and that such a condition is a true zoster where the apparent primary factors (such as arsenic) have prepared the way for the zoster virus lying latent in the organism. The author agrees that clinical observations support this contention.

Lipschutz in 1922, by injecting the contents of herpetic vesicles from zoster into the cornea of rabbits, succeeded in producing a rapidly transient vesicular keratitis. At the same time he showed the same peculiar oxyphil elements in the corneal epithelium which are constantly found in the epithelium of zoster vesicles. On the other hand, neither he nor other investigators succeeded in transferring this keratitis by 'passage' experiments.

Kundratitz inoculated the vesicular contents from 15 cases of zoster into a number of children, in 26 of whom he obtained a positive result. In 20 cases the 'take' was confined to the site of the inoculation, where there developed in from nine to twelve days after inoculation one or more varicella-like vesicles, with umbilication and surrounded by a red halo. In 5 cases there was an associated generalized exanthem completely resembling varicella and appearing on the average fifteen days after inoculation. In one case a general exanthem only appeared. At the same time, on several occasions previously healthy children occupying the same room as those inoculated developed varicella. Among children who had previously had varicella there was no 'take', just as those giving a positive result from inoculation did not develop varicella, either on inoculation with fresh varicella material or on being placed in immediate contact with varicella patients. Histologically the vesicles, both from the site of the inoculation and from the generalized eruption, showed the same picture as that of the vesicles from ordinary zoster and varicella. From these observations Kundratitz concluded that ordinary zoster is due to a specific virus which must be present in the vesicular contents. With this virus a disease was produced in a certain number of children conforming entirely in both its clinical and histological aspects with varicella.

Bruusgaard has made a series of similar experiments. He inoculated 18 children, of which 8 showed a positive 'take'. In 4 cases the inoculation gave rise only to a local reaction; in 4 cases the condition spread so that in

about fourteen days after inoculation there appeared a generalized varicelliform eruption, the lesions of which were both morphologically and histologically similar to those of varicella. Bruusgaard further succeeded in transferring the disease to a healthy child from one who had given a positive result on previous inoculation. Three healthy children in the same ward as one of the inoculated cases developed varicella after the usual incubation period. All these experiments were done in children under 5 years of age; attempts to inoculate adults failed.

The author then discusses the cytological appearances seen in zoster and varicella. He believes that the different cytological appearances shown by the epithelial cells in both the nucleus and protoplasm under the progressive development of the vesicles point to a cellular degeneration of a peculiar type. The constant occurrence of the oxyphil elements in the vesicles of zoster and varicella is, at the same time, of real significance. The fact, therefore, that they are also found in varicellar exanthemata following inoculation, points to a close etiological connection between zoster and varicella.

He concludes that our knowledge of zoster has been extended by experimental research, by cytological and serological investigations, but in regard to the etiological factor of zoster, there remains much which is still undetermined. The same difficulties arise in the interpretation of the reciprocal relations between the different types of other ultra-microscopic viruses; the reason for this is due to the fact that none of these infective substances has been identified morphologically, and that they have not proved culturable in the laboratory. (*See also CHICKEN-POX.*)

TREATMENT.—E. Freude² recommends the paravertebral injection of 2 per cent **Novocain** solution in the region of the nerves in cases of herpes zoster. The pain is rapidly relieved and the lesions subside more rapidly than in the normal course. He quotes two cases in the acute stage and two cases of post-herpetic neuralgia in which good results were obtained.

REFERENCES.—¹*Brit. Jour. Dermatol. and Syph.* 1932, Jan., 1; ²*Münch. med. Woch.* 1931, Sept. 18, 1617.

HIRSCHSPRUNG'S DISEASE (Myä's Disease). (*See also SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.*) *John Fraser, Ch.M., F.R.C.S.Ed.*

This disease presents many points of immediate interest, but perhaps the most outstanding are in relation to matters of etiology and treatment. F. W. Rankin and J. R. Learmonth¹ epitomize the problem of etiology by presenting the possibilities of its being: (1) A true congenital malformation; (2) A development secondary to some obstruction such as a valve or sphincteric achalasia or to such extra-colic sources as an unduly long mesentery or segment torsion; (3) An infective process; (4) The result of a neurogenic disturbance.

There appears to be no reliable evidence in favour of the first hypothesis, and this point is particularly stressed by D. E. Robertson.² There is little to support the view that the process is infective, and we are therefore left with the possibilities that the disorder is secondary to an obstructive process, that it is entirely neurogenic in origin, or that it is a combination of both influences. The indications are that a neurogenic disturbance is the primary factor, and that any obstructive element which may arise, such as valve formation or sphincteric achalasia, is a secondary development. One of the strongest points in favour of this view is the benefit which has resulted from interference with the sympathetic supply in cases of this description.

There is virtually no controversy with regard to the pathology of the disease, except on the one point of hypertrophy of the muscular fibres. Robertson makes the statement that "the very anatomical fact of hypertrophy must

surely denote an obstructive lesion lower down". It is clear, however, that hypertrophy may arise independently of any obstruction, for we have the congenital hypertrophy of the pylorus and the rarer hypertrophy of the ileum, in neither of which can any distal obstructive lesion be demonstrated. Parallels of this kind would seem to indicate that the hypertrophy may arise as the result of a neurogenic disturbance independently of an obstructive error.

TREATMENT.—The particular interest of this disease at the present time is in respect of treatment. Evidence is accumulating that **Interference with the Sympathetic Nerve-supply** to the distal colon affords immediate and striking benefit. The permanence of the benefit is not yet established, as sufficient time has not elapsed. Various operative approaches have been suggested for achieving sympathetic denervation. Wade and Royle recommended an extra-peritoneal route through a flank incision, exposing the left lumbar sympathetic chain, dividing the mesially directed fibres from the ganglia and the main chain itself below the fourth lumbar ganglion. Judd and Adson advocated resection of the 2nd, 3rd, and 4th lumbar sympathetic ganglia on both sides by a transperitoneal route, but it has been pointed out that this method is associated with the disadvantage of possibly depriving the lower limbs of vasomotor control. Rankin and Learmonth, using the transperitoneal route, resect the presacral nerve, and by following this nerve upwards remove the nerves which, following the course of the inferior mesenteric artery, convey inhibitory impulses to the descending and pelvic portions of the colon. In the recent literature these various methods have their advocates. D. E. Robertson³ uses the extraperitoneal flank incision. He records six cases operated on by this method and showing good results after periods of one year or more.

L. E. Barrington-Ward⁴ at a recent meeting of the Royal Society of Medicine presented three cases in which the presacral and inferior mesenteric neurectomy yielded satisfactory results. A point of interest in Barrington-Ward's paper is the observation that one of the cases had been previously operated on by colectomy, but there was a recurrence of symptoms with increasing dilatation of the colon; a presacral neurectomy and inferior mesenteric neurectomy was followed by a striking improvement.

Rankin and Learmonth's most recent contribution concerns eight cases, of which three were treated by the method of the transperitoneal bilateral lumbar ganglionectomy, while in five the presacral and inferior mesenteric resection was employed. It is suggestive that the results were equally good in both groups of cases. It would appear, therefore, that any operative procedure which effectually removes the sympathetic innervation of the pelvic colon and rectum is followed by satisfactory results, but it is evident that the presacral and inferior mesenteric resection has the advantage of ease in achievement, of following exact anatomical and physiological relations, and of avoiding disturbance of the vasomotor functions of the lower limbs.

It is apparent that the operation of ganglionectomy has not yet achieved the degree of popularity on the Continent which it has done in this country and in America. W. Lehmann,⁵ in a contribution to the study of the disease, emphasizes the importance of a sphincteric achalasia, and in his view the later pathology arises secondary to the obstructive influence of this error. Operative measures which imply the **Resection** of the achalasic segment receive consideration, and it will be recalled that in last year's issue of the *MEDICAL ANNUAL* (p. 238) reference was made to a paper which indicated the details of this procedure.

An operative procedure which has the merit of originality is described by V. Orator.⁶ A loop of large intestine embracing the iliac and pelvic colons is separated from its mesenteric attachments, and by means of a probang type

of bougie introduced into the bowel lumen the upper segment of colon is invaginated into the lower, and the apex of the invagination withdrawn until it projects some distance beyond the anus. The intra-abdominal invagination line is fixed by a series of interrupted sutures, while the extruded portion is cut away and the mucous continuity restored by suture (*Plates XIX, XX*). The matter of blood-supply does not appear to offer cause for anxiety, and as the invagination is within the sphincters, there is efficient control. We have said that the suggestion is an original one, but we understand that a method of this kind has been described by Anschütz. There is insufficient evidence yet available as to whether it is likely to prove a satisfactory procedure.

REFERENCES.—¹*Amer. Jour. Surg.* 1932, xv, 219; ²*Ann. of Surg.* 1931, Oct., 670; ³*Canad. Med. Assoc. Jour.* 1931, March, 359; ⁴*Proc. Roy. Soc. Med.* 1932, June, 1221; ⁵*Arch. f. klin. Chir.* 1931, Aug., 47; ⁶*Zentralb. f. Chir.* 1931, Sept., 2244.

Sir W. I. de C. Wheeler, F.R.C.S.I.

This is a rare condition. The reviewer has had two cases under his care in ten years. The colon may contain as much as 47 lb. of fæces. The circumference of the bowel may reach over 3½ ft. The bowels may only act once in two or three weeks, and in some cases several months have elapsed without an evacuation. Until the discovery of the rôle of the sympathetic in this condition, physicians ordered surgical treatment and surgeons recommended a medical régime (W. Mercer¹). In one-third of the cases the sigmoid flexure alone is involved, and excellent results can be obtained by the simple operation of removal of the left sympathetic chain by a trans-peritoneal operation. The removal includes the second, third, and fourth ganglia.

In the reviewer's second case, the limited operation proposed by Rankin and Learmonth was performed (February, 1931). The child was aged 2 years. The pelvic colon when the abdomen was opened had the appearance and consistency of a small motor car tyre, but it was normal in size and consistency for several inches above the rectosigmoid junction. There was some difficulty in this case in defining the presacral nerves and the fibres and ganglia which surround the inferior mesenteric artery. It was found in the cadaver that the arrangement of these nerves and ganglia was variable. The result of operation, however, was most satisfactory. The constipation was cured. The dilatation of the colon seven months after operation was greatly reduced in diameter, but it has never receded to a normal size. (*Plates XXI, XXII*.)

REFERENCE. ¹*Edin. Med. Jour.* 1931, July.

HODGKIN'S DISEASE.

Stanley Davidson, M.D., F.R.C.P.E.

A case of Hodgkin's disease showing a marked eosinophilia is recorded by Gordon Seers.¹ An analysis made by the author of the blood pictures in 35 cases attending Guy's Hospital for deep X-ray therapy indicates, however, that marked eosinophilia occurs only rarely. The blood picture of these 35 cases showed a slight progressive anæmia. Total white-cell and differential counts were found to be within normal limits, any tendency to variation being towards a moderate leucocytosis, with a slight lymphocytic decrease.

With regard to the claims of Miss L'Esperance, referred to in last year's MEDICAL ANNUAL (p. 289), that avian tubercle bacilli were the cause of Hodgkin's disease, the matter is still *sub judice*. Medical opinion, however, appears to be definitely against this view being correct. In three cases of Hodgkin's disease under the reviewer's charge in Aberdeen, glands were removed during febrile periods and were injected by Professor Cruickshank into hens. Six months later the birds were killed and no evidence whatsoever of disease was

found. Confirmatory evidence of the negative results following the injection of lymphadenomatous tissue into bodies is presented by C. E. van Rooyen.²

Perhaps one of the most valuable contributions which have been made during recent years towards arriving at a solution of the etiology of this disease has been the work of M. H. Gordon.³ He has shown that the intracerebral inoculation of rabbits with suitable suspensions of lymphadenomatous tissue was followed by muscular spasms, ataxia, and paralysis. Such results, however, were not produced by the introduction of sarcomatous, carcinomatous, and leukæmic material. It is possible that this test may not only offer a clue to those engaged in elucidating the nature of the disease, but may also be of value to the clinician in arriving at a diagnosis in certain doubtful cases.

TREATMENT.—L. Utz and L. Keatinge,⁴ of Sydney, Australia, report the results of treatment of 25 patients with a **Serum** obtained from hens which had been inoculated with excised Hodgkin's glands. Details of the technique for the preparation of the serum are given, and claims of marked beneficial improvement are made. Unfortunately deep X-ray therapy was used in addition in many cases, and it is therefore impossible to say to what may be ascribed the resulting benefit. In some cases the duration of improvement at the time of publication was only a matter of weeks or months from the time treatment was instituted. It is impossible, therefore, at this stage, to come to any conclusions about this work, and judgement must be deferred for another year or two.

REFERENCES.—¹*Guy's Hosp. Rep.* 1932, Jan., 40; ²*Brit. Med. Jour.* 1933, i, 50; ³*Rose Research on Lymphadenoma*, Bristol, John Wright & Sons; ⁴*Med. Jour. of Australia*, 1932, April 16, 521.

HOOKWORM DISEASE. (See ANKYLOSTOMIASIS.)

HYDROCELE. (See TESTIS, ETC., SURGERY OF.)

HYDRONEPHROSIS, CONGENITAL. (See UROLOGICAL SURGERY IN CHILDHOOD.)

HYPERTENSION AND HYPERPIESIS. A. G. Gibson, M.D., F.R.C.P.

R. S. Palmer¹ refers to the *etiological factors in hypertension*. Amongst these especially are certain strains of the human family and certain individual types. Some persons inherit a predisposition to develop the particular circulatory response which gives rise to hypertension. He refers to Draper's assertion that in women tallness, large skulls, and a relatively greater length of the limb bones is more prone to be associated with hypertension. Males who have the same predisposition have wide-set eyes, a high-arched palate, a long narrow jaw, and a florid face. Moschcowitz describes the type as psychically the antithesis of a child. They are tense, irritable, and have 'single track' minds with narrow mental horizons, but within their range pursue their activities under conditions of tension. The author does not think that there is any relation between focal infection or syphilis and hypertension, but the most important physical factors appear to be obesity and nervous strain, especially the stress of competitive living.

H. O. Gunewardene² has studied the *relation of strokes (apoplexy) to the height of blood-pressure in hyperpiesis*. In the series studied no stroke of any type had appeared in a patient in whom the minimum pressure was under 115; 20 per cent of the cases occurred at figures beyond 115 and 120. The author concludes that cerebral hæmorrhage tends to occur more frequently in those cases of hypertension which have neither marked cardiac enlargement nor

symptoms. Marked cardiac enlargement and cardiac failure tend to diminish the incidence of strokes.

TREATMENT.—In a B.M.A. lecture, John Hay³ sums up in an interesting way the main conclusions of an experienced clinician in the treatment of raised blood-pressure. He divides the patients with pure hyperpiesis into three types: (1) The thin, spare, highly-strung person; (2) The florid, stout, and muscular person; and (3) Women at the menopause. He insists that blood-pressure observations are not always reliable and that the diastolic pressure is of great importance. An increase in this figure signifies that a greater expenditure of energy is necessary by the heart muscle to force open the aortic valves. This involves a permanent extra load on the heart and arteries, with an increase in the size and power of the left ventricle, the end-result of which is cardiac defeat. He draws attention to the great benefit of **Exercise**, when the patient is fit to take it, a fact which was insisted on by Sir Clifford Allbutt. The other main method of lowering the pressure is **Rest**. In any patient with hyperpiesis it is necessary to determine whether the hypertension is: (1) due to psychical influences, (2) due to renal disease, or (3) occurs without any primary renal affection. In many cases the tendency to hyperpiesis is inherited. Fluctuations in the pressure at different times are characteristic of the earlier stages, and are of favourable import. In the later stages when the hyperpiesis is stabilized no great fall occurs. A systolic fall in this stage indicates a failing heart muscle. Changes in the diastolic pressure are less frequent than in the systolic; a fall, therefore, in pulse-pressure is an adverse sign and is frequently accompanied by dyspnoea, alternating pulse, gallop rhythm, or the angina of effort.

The great importance in hyperpiesis of a proper convalescence after infections—even slight infections—is remarked upon. In these patients the cardiac muscle tends to suffer greater damage and to take longer in recovery. In the matter of individual treatment an attempt should be made to discover any important etiological factors, heredity, habits of life, an unsuitable diet, overwork, worry, and embarrassments, and to try to mitigate them. The more important efforts of treatment should be directed to things other than the blood-pressure. Bed for a few weeks is a good beginning in a serious case, followed by a holiday in the country or treatment at a spa. This initial **Rest** is the opportunity for investigating the whole life and physical conditions of the patient, especially to make a search for focal infections and toxæmias. The **Diet** must be restricted in those over weight. The depletion of the portal system by **Mercury** and **Salines** should aid the lessened diet. Other drugs that may be used are **Iodine** or **Iodides**, **Luminal**, **Acetylcholine**, and the **Sulphocyanates**.

W. Edgecombe⁴ reviews the treatment of hyperpiesia from the aspect of a spa physician. In such practice it is possible to review the clinical history over long periods, for patients return again and again for treatment. The treatment here considered is that of **Aperient and Diuretic Mineral Waters with Intestinal Lavage**. In one case quoted in a period of fifteen years the hyperpiesis was apparently the result of extensive diverticulitis of the large bowel. In another case of a man aged 35, who in 1912 had a blood-pressure of 160/110 without renal complication, spa treatment brought down the pressure slightly, and in 1915 the figure was 145/75. Up to the time of writing the pressure had remained within normal limits and the patient was perfectly well. The aim of treatment is to produce vasodilatation by immersion in baths of mineral water at or above body temperature. Peripheral vasodilatation induces a fall of pressure. This is not merely transitory, but endures after each bath and is cumulative over a series of baths. Figures are given of the

reduction in blood-pressure before and after courses of treatment, and, while in the established cases the reduction is not great and in the minimum pressure is not evident, it is clear that in the early stages hyperpiesis may be ameliorated or arrested.

The **Sulphocyanates** are still attracting attention as drugs for lowering blood-pressure in essential hypertension. J. Meakins and W. de M. Scriver⁵ record the results in seven patients. $4\frac{1}{2}$ gr. of sulphocyanate as recommended by Westphal produced no result. The dose was then increased to 12 gr. In one case only was the maximum pressure diminished by as much as 30 mm. of mercury. In two others it was 20 and 16 mm. respectively. In the remainder the average pressure level did not appreciably fall during the exhibition of the drug as compared with a control period. Treatment with this drug is, however, by no means devoid of danger. J. C. Healy⁶ remarks that in doses large enough to reduce pressure appreciably it is toxic and may be lethal. The drug is cumulative, and the symptoms of poisoning are gastro-intestinal irregularities, rashes, and psychosis. The evidence of toxicity increases with the age of the patient. Exfoliative dermatitis has occasionally been described.

W. Goldring and H. Chasis⁷ record the effects of thiocyanate therapy in 72 cases of hyperpiesis. Both sodium and potassium salts were used. The dose given was 5 gr. daily. The blood-pressure was lowered 45 mm. in 32 per cent of the cases, but in 17 per cent toxic symptoms developed, and 2 of the patients died as the result of thiocyanate poisoning. There is very little margin of safety between the effective and the toxic dose.

In the experiments of J. Meakins and W. de M. Scriver,⁵ they state the view that there may be some future for **Ergotamine Tartrate** and **Acetylcholine**.* The former drug was given three times daily beginning with 1 mgrm. and increasing in some cases to as high as 6 mgrm. thrice daily. The blood-pressure falls very rapidly and returns within an hour to the control level. Acetylcholine requires to be given as an intravenous injection freshly prepared in glucose solution of 0.1 to 0.2 grm. There are definite results in 72 per cent, and the effect was temporary over a period of two hours.

REFERENCES.—¹*New Eng. Jour. Med.* 1931, Dec. 24, 1233; ²*Brit. Med. Jour.* i, 1932, 180; ³*Ibid.* 1931, ii, 43; ⁴*Ibid.* 1932, i, 58; ⁵*Canad. Med. Assoc. Jour.* 1931, Sept., 285; ⁶*New Eng. Jour. Med.* 1931, Sept. 17, 581; ⁷*N.Y. State Jour. Med.* 1931, Nov. 1, 1311 (abstr. in *Jour. Amer. Med. Assoc.* 1932, Jan. 2, 81, and in *Arch. of Internat. Med.* 1932, Feb., 321).

HYPERTHYROIDISM AND HYPOTHYROIDISM. (See THYROID GLAND.)

HYPOPHYSIAL DYSOSTOSIS. (See OSSIFICATION, DISEASES OF.)

HYSTERECTOMY, TOTAL AND SUBTOTAL.

Beckwith Whitehouse, M.S., F.C.O.G.

The death of J. O. Polak, always a strong advocate of total as opposed to subtotal hysterectomy for uterine fibroids, has prompted Herbert R. Spencer¹ again to enter a plea for the routine adoption of the complete rather than the incomplete operation. Thirty years ago Spencer published his first paper on this subject, and since then he has always performed total hysterectomy whenever the occasion arose to extirpate the uterine body. The reasons which originally led him to adopt the major operation were various. In the first

*The Anglo-French Drug Co., Ltd., 11 and 12, Guilford Street, London, W.C. 1.

place the partial operation does not permit of effective drainage and therefore is liable to be followed by intrapelvic hæmatoma, retention of discharges, and ileus. More important, however, is the liability of malignant disease developing at some future date in the remaining cervical stump. As the years pass the number of such cases constantly increases. Polak³ collected 256 examples in America and lately R. Monod² has recorded 188 cases in ten years from six centres for radiotherapy in Paris. Amongst 215 cases of cervical carcinoma seen by V. Graff,⁴ of Iowa, 17, or nearly 8 per cent, occurred in a cervix left after subtotal hysterectomy. Many gynæcological surgeons who perform subtotal hysterectomy as a routine method undoubtedly regard the possibility of subsequent cervical carcinoma as rare because they have not personally met with an example. As Spencer rightly observes, the real crux of the matter is not "Has the operator seen it?" but "Has the patient had it?" R. Olshausen,⁵ for example, has stated that in the course of twenty-three years he only saw one case of cancer of the cervical stump among 433 subtotal hysterectomies which he had performed. His successor in Berlin, Professor Bumm,⁶ however, saw in a period of seven years 7 cases, 2 of which were Olshausen's old cases, a fact which speaks for itself.

The reason why subtotal is preferred to total hysterectomy by many surgeons is because the incomplete operation is easier and its immediate mortality is generally considered to be less. The relations of the bladder and the ureters to the cervix uteri no doubt introduce difficulties to the inexperienced, but in the hands of the expert pelvic surgeon the actual increased risk entailed in the major operation is very slight. Indeed, Spencer observes that "with a good technique the immediate mortality of total is not greater (in some cases less) than that of subtotal hysterectomy, although it is performed in the more serious cases." The author's primary mortality in a series of 325 cases was 1·8 per cent. C. Lockyer⁷ in 1924 published a series of 195 total hysterectomies with a mortality of 1·54 per cent. A collective series of 719 cases (H. Spencer, C. Lockyer, and Miles Phillips) contains 14 deaths, a mortality rate of 1·9 per cent.

After all, in assessing the value of the two operations it is not the immediate but the *final* mortality which really matters. As Spencer says, this can only be fully estimated when gynæcologists publish all their cases, examine their tumours carefully, give the results of their mistaken diagnoses after five years, and replace biased impressions by observed facts!

At the present time there is no doubt that total hysterectomy is being performed more and more frequently by gynæcological surgeons, although few have entirely given up doing the subtotal operation. Spencer regards subtotal hysterectomy as 'a nineteenth-century operation', and considers it an opprobrium to gynæcology that cancer of the cervix should ever be left behind as a result of an incomplete technique.

REFERENCES.—¹*Brit. Med. Jour.* 1932, i, 1157; ²*Jour. Amer. Med. Assoc.* 1920, 579; ³*Bull. Soc. belge de Gyn. et d'Obst.* 1930, 118; ⁴Quoted by H. Spencer, loc. cit.; ⁵*Veit's Handbuch der Gynäk.* 2nd ed. 1907, i, 739; ⁶Quoted by H. Spencer, loc. cit.; ⁷*Brit. Med. Jour.* 1924, i, 1038.

INDUSTRIAL DISEASES. (See DERMATITIS VENENATA; HEAT CRAMPS IN INDUSTRY; TOXICOLOGY.)

INFANCY, DISEASES OF. (See ANÆMIAS OF INFANCY; CLEFT PALATE AND HARE-LIP; CONVULSIONS IN INFANCY; JAUNDICE IN CHILDHOOD; NEWBORN, BIRTH INJURIES IN; NEWBORN, HÆMORRHAGIC DISEASE OF; EAR, AFFECTIONS OF; Etc.)

INFANTILE PARALYSIS. (*See* POLIOMYELITIS, ANTERIOR.)**INFLUENZA.***J. D. Rolleston, M.D., F.R.C.P.*

EPIDEMIOLOGY.—According to the official report,¹ all the European countries and the United States of America showed a sudden increase of influenza during the winter of 1930-1. The severity of the outbreak was distinctly less than in the epidemic of 1928-9 with the exception of that in Sweden and the Irish Free State, where it was more severe. The epidemic of 1930-1 was practically confined to Europe and North America, there being no signs of an outbreak in Japan or Australasia. In all the countries affected pneumonia and other complications were remarkably rare.

According to Sir George Buchanan,² who surveys the incidence of influenza in England and Wales from October, 1931, to April, 1932, the epidemic period was not marked by a serious outbreak like that of 1929 (*see* MEDICAL ANNUAL, 1930, p. 289). The highest number of deaths per week was 412, which was reached in the week ending Jan. 9, 1932, as compared with 2183 in the course of a single week in 1929. No unusual features were noted in the 1931-2 epidemic apart from the fact that it was prolonged by a slight rise apparently due to bad weather when it appeared to be on the decline. The age distribution of deaths was normal, the oldest groups paying the heaviest tribute. The clinical features were the same as in previous epidemics.

ETIOLOGY.—During an epidemic of influenza, P. H. Long, E. A. Bliss, and H. M. Carpenter³ produced a condition characterized by fever, prostration, and leukopenia in three chimpanzees by intranasal inoculation of bacteria-free filtrates of rhino-pharyngeal washings obtained from human cases of influenza. A similar condition was produced in another monkey during a non-epidemic period by an intranasal inoculation with unfiltered influenzal material which had been in the ice-box for 123 days.

SYMPTOMS AND COMPLICATIONS.—Several writers have recently drawn attention to the frequency of *pyogenic infections* occurring in influenza whether due to *B. influenza* or to other organisms. Of two cases described by E. Waaler,⁴ the first was a male infant, age 30 months, who was taken ill with symptoms of a feverish cold and later developed a painful swelling of the left knee-joint and meningitis. Death took place a month from the onset. A pure culture of *B. influenza* was obtained from the pus in the knee-joint and also from the blood. The second case was that of a male adult who had suffered from inflammation of the nasal accessory sinuses for the last fifteen years. A practically pure culture of *B. influenza* was obtained from the nasopharynx. A good result followed treatment by antiscarrhal vaccine.

E. v. György⁵ describes four varieties of influenzal *otitis* in infants—namely: (1) A hyperacute toxic form characterized by a sudden and severe onset with rise of temperature to 104°, vomiting, diarrhoea, rapid development of suppurative otitis and subperiosteal abscess, followed by death in a few days in spite of paracentesis and antrotomy. (2) Acute cases in which the course is less rapid and treatment is usually successful. (3) Subacute cases. (4) Cases with a protracted course. In the acute cases the ear symptoms dominate the scene and are accompanied by catarrh of the nasopharynx and lungs, while in the subacute cases the catarrhal symptoms predominate and the otitis is a less prominent feature.

Three cases of influenza in adults complicated by *suppurative parotitis* are reported by M. Villaret and Guillain.⁶ The pus in each case contained pneumococci in large quantities associated in one case with staphylococci. Two made a good recovery, but the third died a month after discharge from hospital with symptoms of acute pulmonary tuberculosis.

A case of *acute suppurative thyroiditis* in convalescence from a typical attack of influenza complicated by pulmonary congestion is reported by Plazy, Germain, and Dupas⁷ in a man aged 22. The suppuration was extensive and accompanied by marked diminution of basal metabolism (-22 per cent) without any other obvious signs of hypothyroidism. Administration of thyroid extract seemed to help in regeneration of the gland, as it was followed by return of the basal metabolism to normal ($+8$ per cent) in ten days.

According to H. L. G. Gérard,⁸ *cardiac influenza* consists almost entirely of functional disturbances, which may be nervous, myocardial, or neuromuscular (bradycardia). These functional disturbances do not as a rule outlast the period of toxi-infection, but in exceptional cases they may persist for a long time. In rare instances they may give rise to symptoms of severe cardiac insufficiency, which generally subside without leaving any trace. The effect of influenza on pre-existing heart disease is extremely variable, but a possible aggravation must always be expected, and the prognosis should be guarded even if the attack of influenza is slight.

Two cases of *endocarditis lenta* due to *B. influenzae* are reported by N. Fiessinger and A. Arnaudet⁹ in women aged 32 and 33 respectively. The clinical symptoms were identical with those of malignant endocarditis due to Schottmüller's *Streptococcus endocarditidis*, which is the usual cause of this condition.

The effect of influenza on *pregnancy* and the *puerperium* is discussed by H. Therivel¹⁰ in a thesis based on sixty-two cases in women aged from 17 to 45. Influenza appears to have a predilection for pregnant women, in whom it is liable to cause abortion in the early stage and premature labour later, except in the mildest attacks. Although the age of the mother and the number of her previous pregnancies do not seem to have any effect, the stage of pregnancy is important, as the nearer it is to term, the more serious the disease is likely to be. Labour in influenzal patients takes place with unusual rapidity and has a disastrous effect upon the disease, frequently giving rise to a rapidly fatal pneumonia. The effect of the mother's illness upon the children is very bad; a certain number die in utero or during or after delivery, and many of those who survive have a subnormal weight. The distinction between influenza and puerperal fever may be very difficult, but the pulse is of considerable diagnostic value, as it remains slow in influenza and becomes rapid in puerperal fever (Wallich's sign).

(See also PREGNANCY AND ITS COMPLICATIONS.)

Both F. Roy¹¹ and L. Steiner¹² devote their inaugural theses to *B. influenzae meningitis* and arrive at almost identical conclusions. They maintain that it is an autonomous disease and only in exceptional cases a complication of influenza. It has a predilection for children, in whom 88 per cent of the cases occur, but it may also be observed in adults. The prognosis is extremely grave in infants, in whom the mortality is 96 per cent. Recovery, however, may take place either spontaneously or as the result of the intrathecal injection of a vaccine or specific serum. Steiner distinguishes an acute form which resembles meningococcal meningitis from a subacute form which may be mistaken for tuberculous meningitis. K. Rupilius¹³ also records two fatal cases of *B. Pfeiffer* meningitis in male infants aged 7 and 8 months respectively which occurred apart from an epidemic of influenza.

DIAGNOSIS.—Little attention has been paid to the behaviour of Ehrlich's *diazo reaction* in influenza, and it is generally regarded as negative in that disease. K. Triga,¹⁴ however, reports an outbreak of influenza which occurred in Vienna during the winter of 1931–2 affecting 53 persons aged between 45 and 80, only 16 of whom showed a definitely negative reaction, while in 12 it

was faintly positive and in 25 strongly positive. The reaction was performed on the first or second day of disease and repeated in a week to a fortnight after the temperature had become finally normal, when it was invariably negative. If subsequent observations confirm these results, the reaction will lose much of its value in the diagnosis of influenza from enteric fever.

TREATMENT.—H. K. Ward and L. D. Fothergill¹⁵ record five cases of *influenzal meningitis* in children treated by intrathecal and intraventricular injection of fresh **Normal Serum** and **Specific Antiserum**. Although all died, the cerebrospinal fluid in every case became sterile. Death was probably due to localization of the inflammatory process in areas shut off from the general subarachnoid space which were thus protected from the action of the serum.

REFERENCES.—¹*Monthly Epid. Report of Health Sect. League of Nat.* 1931, 295; ²*Bull. Off. internal. d'Hyg. publ.* 1932, 959; ³*Jour. Amer. Med. Assoc.* 1931, xcvi, 1122; ⁴*Norsk Mag. f. Laege.* 1931, 715; ⁵*Wien. klin. Woch.* 1932, 818; ⁶*Gaz. des Hôp.* 1931, 1563; ⁷*Bull. Soc. méd. Hôp. de Paris*, 1932, 675; ⁸*Thèse de Paris*, 1931, No. 297; ⁹*Bull. Soc. méd. Hôp. de Paris*, 1932, 629; ¹⁰*Thèse de Paris*, 1931, No. 484; ¹¹*Ibid.* No. 525; ¹²*Ibid.* 1932, No. 118; ¹³*Arch. f. Kinderh.* 1931, xciv, 307; ¹⁴*Wien. klin. Woch.* 1932, 720; ¹⁵*Amer. Jour. Dis. Child.* 1932, xliii, 873.

INSULIN AND NON-DIABETIC STATES.

W. Langdon Brown, M.D., F.R.C.P.

C. W. Lueders and M. E. Watson,¹ employing insulin in cases of non-diabetic malnutrition, found that it produced a definite increase in the concentration of pancreatic enzymes, to which they attribute much of the general improvement resulting from this treatment. It is interesting to find that administration of the internal secretion of a gland should thus stimulate its external secretion.

L. H. Nahum and H. E. Himwich,² reporting benefit from insulin in patients under weight, discuss the influence of the sympathetic in anorexia. The sympathetic would stimulate the production of more adrenalin, which is antagonistic to insulin.

H. Moore and others³ report a case of hypoglycaemia with severe symptoms in a woman who had had been given three intravenous injections of novarsenobillon at another hospital although her Wassermann reaction had been continuously negative. There was also transient achlorhydria and faulty digestion of starch. The acute symptoms were promptly relieved by the intravenous injection of 10 grm. of glucose. It is surprising to learn in such a case that the liver function tests were normal. They appear to regard the condition as due to a toxic hyperinsulinism.

Marcel Labbé and others⁴ are inclined to attribute some cases of excessive appetite to a hypoglycaemia produced by hyperinsulinism (*see also OBESITY*).

REFERENCES.—¹*Arch. of Internal Med.* 1932, Feb., 330; ²*Amer. Jour. Med. Sci.* 1932, May, 608; ³*Brit. Med. Jour.* 1931, ii, 837; ⁴*Presse méd.* 1932, June 4, 885.

INTESTINAL OBSTRUCTION.

A. Rendle Short, M.D., F.R.C.S.

PATHOLOGY.—J. Bottin¹ (Liège) contributes an interesting and original essay on this subject and maintains that the toxic theory fails to explain the symptoms or the fatal issue in cases of intestinal obstruction, that as a rule there is not enough infection to kill the patient, that the dehydration and hypochloræmia theory is inadequate in itself, nor does the introduction of hypertonic saline invariably save the patient. He believes that pancreatitis, secondary to the accumulation of products of obstruction in the duodenum, is the real cause of death. If the pancreatic ducts are ligatured severe symptoms following the injection of these products into the duodenum are averted.

TREATMENT.—G. Stout² (Los Angeles) believes that the administration of chlorides, upper intestinal drainage, and forced fluids are just as useful in the treatment of functional (paralytic) obstruction as for the organic type. He would start these remedies in any case in which any degree of peritonitis was found at operation, so as to anticipate ileus. H. Kohler³ speaks well of a new German preparation called **Tonephin*** given by injection, for atony of the bowel.

STATISTICS.—J. J. Morton⁴ (Rochester, N.Y.) analyses 105 cases, with a death-rate of 28.5 per cent. When there was complete strangulation of bowel, 50 per cent died.

I. J. Vidgoff⁵ (Los Angeles) reports 235 cases of acute obstruction, with the appalling mortality of 51.48 per cent, which, as he remarks, is no better than it was thirty years ago.

The Vienna figures are given by F. Starlinger⁶: of 333 cases, 52.3 per cent died. This does not include strangulated hernias. (For English figures, see MEDICAL ANNUAL, 1927, p. 238.)

REFERENCES.—¹*Rev. de Chir.* 1932, Jan., 5; ²*Ann. of Surg.*, 1931, Sept., 347; ³*Zentralbl. f. Chir.* 1931, Oct., 2702; ⁴*Ann. of Surg.* 1932, June, 856; ⁵*Ibid.* 801; ⁶*Wien. klin. Woch.* 1931, Dec., 1560.

INTESTINAL WORMS. (See WORMS, INTESTINAL.)

INTESTINES, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

X-ray Diagnosis of Lesions of the Intestine.—Several papers deal with this subject. We may refer to the substance of three, one in English by E. T. C. Milligan and G. Simon,¹ from St. Bartholomew's Hospital, one in French by E. Piot,² and the third in German by H. Durst and S. Utschneider,³ from Munich. A plain X-ray will often show the distended gas-filled bowel, ending abruptly at the site of obstruction. Large films should be used. If a plain X-ray is taken with the patient standing in cases of obstruction, multiple horizontal levels of fluid may be demonstrated (see MEDICAL ANNUAL, 1932, Plate XXIX); or a very small barium meal emulsified in liquid paraffin (Piot) may be used to outline the walls of the small gut. If it is obstructed, there will be three stages rendered visible: in the premonitory stage, the bowel is dilated and transit is slow; in the next stage peristalsis is vigorous and painful, with borborygmi, and the peristalsis may be seen with the aid of the fluorescent screen ending at the point obstructed; in the third stage there is fatigue-distension of the obstructed coils.

Tuberculosis of the Small Intestine.—This condition is often found post mortem in persons dying of phthisis, but occasionally it dominates the clinical picture during life. F. W. White and I. R. Jankelson⁴ (Boston) relate two cases of tuberculosis of the jejunum. In both the main symptom was attacks of mid-abdominal pain, and X rays showed small-intestine stenosis. At operation a tuberculous stricture was found. Both recovered, but one eventually died of phthisis. J. M. T. Finney and his son⁵ record a similar case in which a tuberculous mass was found and removed from the ileum. A second operation had to be done two months later for recurrence.

Lymphosarcoma.—A. Ullman and B. Abeshouse⁶ (Baltimore) record a case, and have collected 125 more from the literature, in addition to a series published by Graves in 1919, making 375 cases in all. The small gut is involved twice as frequently as the large. The average age is about 83, and males suffer more often than females. The clinical picture is usually one of acute or chronic obstruction, and a pre-operation diagnosis is seldom possible. The growth may be annular or polypoid, and there is often an 'aneurysmal' dilatation of the

* Bayer Products Ltd., 19, St. Dunstan's Hill, London, E.C. 3.

lumen. Intussusception may occur. Metastases are constant. The treatment is radical resection in early cases, and radiation.

Mesenteric Infarction.—Quite a number of writers have dealt with this subject in the past year, including F. D'Abreu⁷ (Birmingham), L. Larson⁸ (Mayo Clinic), F. D. Ackman⁹ (Montreal), J. L. Meyer¹⁰ (Chicago), and I. M. Lapointe and P. Roche¹¹. Some of these cases are due to thrombosed veins and others to arterial obstruction—15 of the former to 6 of the latter (Lapointe). Larson found 16 venous, 14 arterial, and 6 mixed. Thrombi derived from the wall of the heart, arteritis or arteriosclerosis of the superior mesenteric artery, and septic processes leading to venous thrombosis were the usual causes. The symptoms are those of intestinal obstruction, often with blood in the vomit or in a diarrhoeal stool. Merely tying main branches of the superior mesenteric artery in animals is not enough to cause infarction, but in man there are usually other causative factors, such as arteriosclerosis or feeble heart action. From French sources, about 42 cures after resection of infarcted gut are reported. D'Abreu's 5 cases were all fatal after operation. At the Mayo Clinic, of 36 cases all were fatal. Meyer records 1 recovery after resection, and finds 38 others in the literature.

[I have had one successful case cured by resection, in which the ascending colon was involved.—A. R. S.]

Intestinal Fistulae.—E. B. Potter¹² (Ann Arbor) advises that the best way to prevent digestion of the skin is to apply a continual suction apparatus, watched and worked by the patient himself. During sleep, the prone position on an anterior Bradford frame is used.

REFERENCES.—¹*Brit. Med. Jour.* 1931, i, 1114; ²*Presse méd.* 1932, April, 656; ³*Münch. med. Woch.* 1932, April, 597; ⁴*Jour. Amer. Med. Assoc.* 1932, Jan., 23; ⁵*Amer. Jour. Surg.* 1931, Oct., 149; ⁶*Ann. of Surg.* 1932, June, 878; ⁷*Lancet*, 1932, i, 772; ⁸*Surg. Gynecol. and Obst.* 1931, July, 54; ⁹*Canad. Med. Assoc. Jour.* 1931, Dec., 657; ¹⁰*Ann. of Surg.* 1931, July, 88; ¹¹*Bull. et Mém. Soc. nat. de Chir.* 1931, Dec., 1556; ¹²*Ann. of Surg.* 1932, May, 700.

INTRATHORACIC TUMOURS. (See also BRONCHUS, BENIGN TUMOURS OF; LUNGS AND MEDIASTINUM, PRIMARY GROWTHS OF.)

A. Tudor Edwards, M.Ch., F.R.C.S.

As in other branches of thoracic surgery, the literature concerned with intrathoracic tumours is rapidly attaining large dimensions. Diagnosis is being rapidly improved and the more routine examination of the chest by X rays is resulting in the discovery of tumours in the thorax whose existence would otherwise not have been suspected. There would appear to be little doubt that the incidence of malignant disease in the lung and pleura is increasing. It is therefore essential that strenuous efforts should be made to deal with this disease at as early a stage as possible. This will necessitate routine radiological examination of every patient in whom the diagnosis is not clear and definite and does not completely explain the symptoms referable to the chest. Necessarily, operative measures are more likely to meet with success in the early stage, and even if radical extirpation is not possible, radium therapy may ameliorate and thereby prolong life if cure is out of the question.

Pleural tumours are relatively rare, and are divided by H. Lichtenstein¹ into three groups: (1) Those with wide-spread plaque-like growths microscopically resembling an endothelioma; (2) Metastatic pleural tumours arising most commonly by extension from a bronchial carcinoma; and (3) Those with the histological appearance of sarcoma but apparently benign in their behaviour.

A. Tudor Edwards² is of opinion that most of the so-called benign pleural

tumours arise outside the pleura and project into the pleural cavity, being covered by a layer of parietal pleura. They differ from the malignant types in that the latter, consisting of endothelioma and sarcoma, arise from the pleural tissues and almost invariably give rise to effusions of fluid, often blood-stained. Although the malignant variety may be removable in occasional instances, in the majority of cases **Radiotherapy** offers the only possibility of amelioration.

In the same paper the necessity for early diagnosis, not only in malignant disease but in benign growths also, is emphasized, as these tend to destroy life by encroaching upon vital structures, and even when exact diagnosis cannot be made after full investigation, **Thoracotomy** is advised. Investigation should consist of careful radiological examination from several aspects, followed as indicated by further skiagrams after pneumothorax or gas replacement of effusions, or the introduction of lipiodol into the bronchi. Occasionally, thoracoscopy will be of value, and where there is indication by the previous examinations that bronchial obstruction is present, bronchoscopy is essential. It is also indicated where hæmoptysis is a definite symptom and tuberculosis eliminated by repeated sputum examination.

F. Sauerbruch and R. Nissen,³ in a paper on the recognition and treatment of malignant tumours of the lung, draw attention to the necessity of careful radiological examination, and point out the differences observable between infective conditions of the lung and malignant disease. The similarity of the radiological appearances of abscess and certain types of breaking-down malignant growth is stressed, and where the diagnosis is doubtful the urgent necessity of exploration is indicated.

REFERENCES.—¹*Deut. Ztsch. f. Chir.* 1931, cccxxxiii, 29, ²*Brit. Med. Jour.* 1932, i, 827, ³*Arch. f. klin. Chir.* 1932, May, 118.

Sir W. I. de C. Wheeler, F.R.C.S.I.

A. Tudor Edwards¹ states that intrathoracic tumours may be divided into three main groups: the pleural, the mediastinal, and the pulmonary. Any of these may be benign or malignant.

Pleural Tumours.—Some of the so-called benign pleural tumours may be symptomless until they have reached a considerable size. Localized pain and an irritating cough may be present. Effusions are rare in the presence of benign growths. Radiological examination is aided by the production of artificial pneumothorax. Benign tumours within the thorax tend to encroach upon vital structures and many of them are potentially malignant.

Malignant pleural tumours are accompanied by a pleural effusion. This is serous in the early stages but hæmorrhagic later. The first symptom is either localized pain or marked dyspnoea. Aspiration of the fluid and its replacement by oxygen or air, followed by radiological examination, will enable one to see the irregular growth on the surface of the pleura. Surgical removal is seldom possible.

Mediastinal Tumours.—These may be classified as: (1) Intrathoracic goitres; (2) Dermoids and teratomas. Intrathoracic goitres are dealt with in another article (see **THYROID SURGERY**). Dermoids and teratomas tend to dissect outwards between the lobes of the lung. They may arise in the anterior or posterior mediastinum, and in the latter case tend to pass up in close relationship with the superior vena cava on the right, or the arch of the aorta on the left, side. Skiagrams following artificial pneumothorax will show the tumour buried in the collapsed lung. The treatment is operative removal.

REFERENCE.—¹*Brit. Med. Jour.* 1932, i, 827.

INTUSSUSCEPTION.*John Fraser, Ch.M., F.R.C.S.Ed.*

INCIDENCE.—Certain points in the etiology of acute intussusception have long been the subject of discussion, and among them is the matter of the seasonal incidence of the disease. This question has often been alluded to in statistical reviews of the disorder, and a reasonable explanation of the occurrence was first put forward by H. P. Brown, jun.¹ He drew attention to the fact that the highest incidence of the disease is in the summer months, and he associated this with a variation in the amount of lymphoid tissue, that tissue being most marked in children under a year old, and showing its maximum increase during the summer period: the bearing of this in relation to the development of intussusception being, of course, the enlargement of Peyer's patches, and the possibility of a mechanical invagination of the bowel wall.

H. G. Close² in a review of 363 cases operated on in Guy's Hospital in the period 1904-27 refers to this matter, and the statistics he supplies appear to confirm the idea of the seasonal incidence of the disease.

The basis of the majority of the contributions concerning this subject, however, bear on matters of detail in treatment and on mortality.

TREATMENT.—Treatment by **Barium Enema** has won some popularity in French clinics, and the procedure is referred to by M. Lagrot,³ who apparently attaches considerable value to it, but safeguards himself to the extent of recommending confirmation of complete reduction by exploration of the right iliac fossa. Lagrot's paper has a further point of interest, namely, in relation to the use of large doses of **Serum** in the pre-operative and post-operative periods. In operations on a child of four years for acute intussusception he injects 250 c.c. of serum before operation and two series of 250 c.c. in the immediate post-operative period. The nature of the serum is not fully stated, but in the absence of further detail we presume it to be normal horse serum.

The problem of the irreducible intussusception continues to form the subject of discussion, and rightly so, for it is recognized that when resection is practised the mortality is a forbidding one. When Jonathan Hutchinson⁴ wrote a paper on acute intussusception in 1874 he recorded the results of purely conservative treatment in 131 cases over a period of sixty-five years (1807-72). Excluding 30 cases in which the diagnosis offered possibilities of doubt, we find that the survival percentage was slightly over 20, 3 cases being reduced by enemata, while 19 survived as the result of sloughing of the intussuscepted gut. These are remarkable figures, and probably their significance is not fully appreciated at the present day. A record of this kind raises the question whether resection with its high mortality is ever a justifiable procedure, and many attempts have been made to establish a technique which would obviate the necessity for resection. In last year's issue of the *MEDICAL ANNUAL* (p. 258) the method of lateral anastomosis, leaving the intussuscepted portion *in situ*, was reviewed. This year reference is made to the value of Brown's¹ method in a paper by F. R. Robbins.⁵ The method consists in division of the constricting ring by an incision through the wall of the gut on the antimesenteric surface. It is apparent that this method, while of value in the irreducible intussusception, is not applicable when gangrene exists. That the method has value in certain circumstances is evident in successful cases recorded by Brown and by O. D. Johnson.⁶

There have been numerous instances of recurrence of intussusception after one or more successful reductions, and many procedures have been designed to prevent recurrence. The more popular of these, as outlined by O. F. Lamson,⁷ are shortening the mesentery of the ileum, suturing the omentum to the ileum, and suturing the ileum to the parietal peritoneum. Lamson is critical

of the hitherto suggested methods, and he outlines a procedure of suturing the ileum to the caecum in such a way as to secure the ileocaecal valve from the process of invagination (Plate XXII).

The last matter to which it is necessary to make allusion is that of the mortality of the disease. We have referred to Jonathan Hutchinson's paper and to the interest of the mortality figures when conservative treatment was a necessity (78 per cent). There is no doubt, of course, that the operative mortality is infinitely less than that obtained during the conservative régime. Close's record of the Guy's Hospital cases (868) showed a mortality^a of 31 per cent, but these figures were obtained over a period of twenty-five years, and analysis shows that there has been a reduction in the operative mortality from 40 per cent in the early part of the period to 20 per cent in the last decade. Robbins's figures concern 34 cases with a mortality of 35.3 per cent, while E. W. Peterson and R. F. Carter^b record 31 cases with a 31 per cent mortality.

It is clear, of course, that mortality figures are intimately related to the condition of the intussusception and the procedure necessitated for its correction. Where manipulative reduction is possible the mortality figure does not exceed 10 to 15 per cent; when resection is adopted the figure is 80 per cent or more. It comes to this—that the mortality of resection is forbidding, and is probably greater than that resulting from conservative methods. There are indications that it might be better to abandon the procedure and to remain satisfied with a short circuit to overcome obstruction, leaving the intussuscepted portion to undergo a process of natural resolution by sloughing. On the other hand, we have to bear in mind that resection is sometimes followed by brilliant results. Robbins, for example, describes a successful resection of practically the entire large intestine for gangrenous intussusception in a baby of seven weeks.

REFERENCES.—¹*Ann. of Surg.* 1925, 637; ²*Guy's Hosp. Rep.* 1931, Oct., 436 ³*Bull. et Mém. Soc. de Chir.* 1932, Feb. 20, 253; ⁴*Med.-Chir. Trans.* 1874, lvi, 31, ⁵*Ann. of Surg.* 1932, June, 830. ⁶*Nebraska Med. Jour.* 1929, March, 119, ⁷*Surg Gynecol. and Obst.* 1932, March, 564; ⁸*Ann. of Surg.* 1932, July, 94.

INTUSSUSCEPTION, RADIOGRAPHY IN.

Reginald Miller, M.D., F.R.C.P.

R. Miller¹ has had the opportunity of studying a subacute case of intussusception by means of a barium meal and enema, and as radiograms of this condition are rarely published the prints obtained are reproduced here (Plates XXIV-XXVI). In this particular case, a girl of just over 8 years of age, symptoms were present for ten days. For the last four days she was observed by the author, and a tumour which was obviously an intussusception was clearly felt. As the child was in good condition and only suffering from occasional attacks of colic, an opaque enema was administered on the sixth day of disease and a barium meal on the eighth day. Operation on the tenth day showed that the intussusception, so clearly seen in the radiograms, had undergone complete reduction.

The question arises whether in acute cases in which the diagnosis may be at first in doubt, help might not be obtained by means of an opaque enema with screening or film. As a rule where there is a difficulty in establishing the diagnosis of acute intussusception the demonstration of any sort of intestinal obstruction would settle the question, for this type of intussusception, at all events as a physician sees it, has to be distinguished usually from a non-obstructive disease such as acute ileo-colitis. In the subacute case here referred to the obstruction was clearly visible on screen examination, and an attempt at this would lead to no great expenditure of valuable time, at all events in hospital practice.

PLATE XXIV

SUB-ACUTE INTUSSUSCEPTION

(REGINALD MÜLLER)

Fig. 1. - Barium enema: immediately after evacuation.

*Plates XXIV-XXVI by kind permission of
"Archives of Diseases in Childhood"*

The complete reduction of the intussusception in the subacute type of case reported here raises another question. Years ago attempts to reduce an acute intussusception were made by the pressure of water introduced into the colon from below. This method has been very properly given up as unsafe. For one thing it was difficult to be sure that the intussusception was completely reduced at the time of the attempt, and for another there was the danger of subjecting gangrenous gut to too great a pressure. By selecting only very early cases the second danger of this procedure might be obviated; and by substituting for the water an opaque enema and carrying out the injection entirely under screen control, it may be tentatively suggested, that the danger of leaving the last part of the invagination unreduced might perhaps also be avoided.

Since the foregoing was written R. H. Boggon² has published two cases of intussusception in which good skiagrams were obtained by means of barium enemata. He states that "as the opaque enema is a comparatively simple procedure, and the effect on the child merely that of discomfort, it seems reasonable to consider its use in doubtful or subacute cases, for the additional evidence obtained makes the diagnosis conclusive". Approaching the subject from the standpoint of a surgeon, Boggon notes that the use of the opaque enema may in part reduce the intussusception, and gives it as his opinion that "this partial reduction should not be a temptation to postpone operation on the grounds that total reduction may occur". He makes mention of a previous paper on this subject published in America by I. M. Snow³ as far back as 1913.

REFERENCES.—*Arch. of Dis. Childh.* 1932, vii, 209, ²*Lancet*, 1932, ii, 1051, ³*Amer. Jour. Dis. Child.* 1913, vi, 93.

IRITIS AND IRIDOCYCLITIS.

W. S. Duke-Elder, M.D., F.R.C.S.

ETIOLOGY.—Within the last few years changes of some considerable importance have become established in our ideas of the etiology and treatment of iritis and iridocyclitis. Since rational treatment depends very largely upon etiology, the former is of greater importance and interest. In this review we can exclude those relatively rare and obvious cases wherein an infection is introduced into the eye by a perforating wound or ulcer, and we shall confine ourselves to a consideration of that much larger and more obscure type wherein the causative agent is carried to the eye through the blood-stream. In this latter group of cases there is a small minority wherein actual tuberculous and gummatous nodules are present—in these the type and method of infection are obvious; but the average case of iritis presents a nondescript, non-specific clinical picture, and can only be assessed as a member of a very heterogeneous group in which scientific classification is as yet quite impossible.

It is undoubted and generally admitted that cases of this character are associated with tubercle, syphilis, and gonorrhoea, and it is as certain that other cases are associated with an infective lesion (streptococcal, staphylococcal, or others) in some other part of the body; but the uncertainty which is attached to the average case and the difficulties that lie in the way of making a diagnosis are so great that any conclusion based on sound statistical material is quite impossible. Indeed, opinions on this question vary so much between individual clinicians, between different schools, and between different countries, that a study of the recent literature leads nowhere. In Central Europe, for example, a vast number of cases of nondescript chronic and recurrent iritis are unhesitatingly labelled tuberculous; thus Löwenstein in a recent book declares that it is widely accepted that 50 per cent of cases of uveitis are

produced by tuberculosis. In this country, on the other hand, few ophthalmologists—if any—would admit such a thesis, and there is a tendency for the etiology to be sought in an infective focus in some remote part of the body. In America the general opinion seems to fluctuate between the two extremes. It is certainly true that diseases vary with their geographical and racial incidence, and that tuberculosis may be much more rife in Central Europe than it is here; but the fact remains that medical opinion is in the unsatisfactory state with regard to this question that the same clinical picture would be labelled tuberculosis in Germany or Vienna, and the result of a focal infection in this country, while, subjected to American enthusiasm, the same patient would be treated by having his teeth extracted and his tonsils removed and at the same time be subjected to a course of tuberculin.

There is no doubt that an iritis can be produced by the actual lodgement in the eye of micro-organisms. This has been abundantly proved experimentally since the classical experiments of Cohnheim in 1867, who inoculated guinea-pigs with tuberculous material and found on autopsy tubercles in the uveal tract. At the same time it would seem hardly probable that this mechanism represents the usual method of infection. It would be necessary in this event to postulate that organisms actually entered the blood-stream from the teeth, tonsils, intestines, and so on, and entered the eye, setting up inflammatory changes there. Apart from the fact that the experimental introduction of a suspension of organisms into the eye usually leads to an acute inflammation which develops into a panophthalmitis—a picture quite different from the usual case of recurrent iritis—it is difficult to imagine how the organisms could reach the eye. If they do so by the blood-stream, they must first traverse the capillary sieve presented by the lungs, and their presence in the eye would be expected to coincide with bacterial emboli in many other parts of the body; but pneumonia does not occur with iritis, nor does it commonly form part of a general pyæmia. It would thus appear necessary to assume that either bacteria or their toxins may have a very highly developed specificity for the uveal tissues, or alternatively that these tissues can acquire a supersensitivity far in excess of those possessed by most regions of the body.

That *infective foci* in remote parts of the body do figure in the etiology of iritis rests upon a very weighty mass of evidence. The first to draw attention forcibly to the matter was William Lang in a paper on "The Influence of Chronic Sepsis upon Eye Diseases" read in 1913 before the Royal Society of Medicine. The evidence presented at that time has been corroborated by clinical findings on innumerable occasions of patients suffering from iritis, in whom an infective focus was established and in whom the ocular symptoms cleared upon removal of that focus. Direct experimental proof that this is indeed the case has been recently supplied, particularly by workers in America. In 1916 Irons, Brown, and Nadler produced an iritis in rabbits by the intravenous injection of streptococci isolated from a patient suffering from this disease. This result was corroborated by Meisser and Gardner in 1928, who produced a similar experimental iritis with a streptococcus isolated from an infective tooth in a patient suffering from acute iritis. Similarly Haden, in 1928, produced an iritis in 68 per cent of rabbits inoculated with cultures from the teeth of patients who had iritis, and only in 14·8 per cent of rabbits inoculated with cultures from patients who had infected teeth but no uveal complications.

Rosenow (1915-27), and Rosenow and Nickel, working in the Mayo Clinic (1929-32), have carried out very extensive researches on the subject to determine by means of experiments on elective localization the relative importance of focal infections in the tonsils, teeth, prostate, and uterine cervix in persons

who had diseases of the eye, arthritis, myocarditis, and other infections. Their results were very striking: in 215 rabbits which received injections of 74 cultures of streptococci derived from 69 patients who had intra-ocular lesions, an iritis developed in 48 per cent. Cultures derived from patients who had other lesions behaved similarly, but instead of causing reactions predominantly in the eyes, the streptococci tended to localize in the regions corresponding to the tissues affected in the patients from whom they were taken. There appears, therefore, to be some grounds for the belief that a very definite degree of tissue-selectivity does exist.

There is also a considerable amount of evidence that sensitization of the uveal tissues may play a part in the occurrence, and especially in the recurrence, of inflammation of the uveal tissues. A number of investigators have immunized animals by subcutaneous, intravenous, or intraperitoneal injections of a foreign protein, and obtained a marked iritis on subsequent intra-ocular injection of the same material. In this connection the recent work of Seegal (1930) is interesting; but probably that of Brown (1932) is most suggestive, who has brought forward evidence that organisms may give rise to the same sensitivity. He injected into the anterior chamber of rabbits a suspension of a strain of a hæmolytic streptococcus, and after the reaction had died down, found, on intravenous injection of the same organism, that a violent recurrence of iritis became evident. A more interesting series of experiments showed that the same result followed the injection of the toxin of a strain of streptococcus. In each case control eyes injected initially with distilled water showed no subsequent reaction.

It would appear, therefore, that the possibility has been established that not only an organism but a toxin can produce sensitization in the tissues of the uveal tract, and that recurrences of inflammation can be excited by a liberation of quantities of that toxin into the blood-stream. In this event the stage is occupied not so much by the bacteria as by the local allergic state to which their presence has given rise. The problem thus shows some affinities to the sensitivity of the mucous membranes in hay fever, recurrent attacks of urticaria, or the phenomena of serum sickness, and perhaps may be analogous to the evanescent swellings and shifting joint pains in acute rheumatic fever.

In the great majority of cases, therefore, the discovery of the etiology of a typical case of iritis is a problem beset with difficulties, and about which a conclusion can rarely be reached with certainty. Each case should involve an exhaustive examination of the individual patient. Tuberculosis may be diagnosed tentatively on the chronicity and recalcitrant nature of the disease, on the large 'mutton-fat' keratic precipitates, on the family and personal history of the patient, on the presence elsewhere of medical or surgical tubercle, and—valuable largely as negative rather than positive evidence—on positive serum reactions such as the von Pirquet or Mantoux test. Gonorrhœa is usually suggested by the violence and recalcitrant course of the recurrences, with the occasional appearance of a hypopyon or a hyphæma; syphilis should be eliminated by the clinical history and general symptoms as well as by the Wassermann reaction; and if none of these opens up a hopeful avenue for treatment, a search for focal sepsis should be made. This should include the teeth, the tonsils, the nasal sinuses, the alimentary canal, the prostate, the cervix uteri, the urinary tract, and so on, and in the assessment of these it is to be remembered that more than one may exist simultaneously. Thus it is possible for a streptococcal infection to involve the teeth, the tonsils, and the colon, or for two different types of infection to be firmly established in two different regions.

The removal of a particular focus, therefore, although it is frequently

followed by a spectacular cure, cannot be relied upon to remove the source of infection from each individual case. Some information may be obtained from the reaction of the blood to the various strains of organisms isolated, and it may be in the future that some help may accrue from eliciting a specificity to uveal tissue by injecting the various organisms into experimental rabbits in the hope that the particular one involved will excite an iritis. In the present state of our knowledge the most that can be done is to eliminate in so far as is practicable the most obvious source and to increase the resistance of the patient as much as possible by the judicious employment of autogenous vaccines.

From the etiological point of view it is probably worth while to summarize the very carefully compiled clinical data of Gifford (1931), who analysed 118 cases of iritis from this point of view. Of these 22 per cent were of tonsillar and 16.9 per cent of syphilitic origin, 12.7 per cent were due to infected teeth, 8.5 per cent to combined infections, 6.8 per cent to sinusitis, and 6.8 per cent to gonorrhoea; of the last, 5.1 per cent were attributed to prostatic infection, 1.7 per cent to pelvic infection in women. A further 1.7 per cent were diabetic, while in 16.1 per cent no cause was found.

So far as *syphilitic iritis* is concerned, it must be remembered that although syphilis is a common disease, non-typical syphilitic iritis does not appear to be common. The most recent figures show that it occurs only in from 0.42 to 5.37 per cent of patients. Its various manifestations have recently been reviewed by Klauder (1932). We may differentiate three different types. The first of these occurs in the relatively acute secondary stage, and although from the diagnostic standpoint it is unfortunate that most of these cases are quite indistinguishable from any ordinary iritis, according to the findings of Moore (1931), practically every case has other recognizable signs of secondary syphilis elsewhere, although sometimes these have to be looked for carefully. The second type may be involved in the course of the disease, or possibly as the result of faulty treatment. If, for example, in a case of well-established untreated syphilis, arsenicals are vigorously used in the early stages, a large number of spirochaetes are killed, their toxins are liberated, and a Herxheimer reaction is produced which may involve the iris. On the other hand, if efficient treatment is begun early but is not continued for a long enough period, the iris is very liable to a *rezidiv* reaction, since it and the uveal tract, in common with the central nervous system, are slow to develop natural immunity. If, therefore, the normal inflammatory response has been aborted by the early use of antisymphilitic remedies, the few spirochaetes that remain after treatment has ceased will find, so to speak, a virgin soil and grow apace, with the production of severe iritis. It is worthy of note in this connection that spinal-fluid findings indicate a higher percentage of neurosyphilis in patients with iritis than in those without it (Moore, 1931). These recurrent attacks of inflammation were considerably more frequent when the possible harmful effects of initial large doses of arsenical compounds were not fully realized, and when it was thought that relatively few doses constituted adequate therapy.

Late syphilitic iritis is not at all easy to diagnose. On the one hand it is obvious that many patients who are suffering from syphilis may develop iritis from other causes; while, on the other hand, it is not uncommon in late syphilitic iritis, as in other late manifestations of this disease, to find the Wassermann and other serological tests negative. In Moore's survey the Wassermann was positive in 97 per cent of early specific iritis, in 55 per cent of recurrent cases, and in 81 per cent of late cases. Nor is the therapeutic test reliable, since ocular manifestations of syphilis are notoriously difficult to

cure, and many cases of non-specific iritis are benefited by a course of arsenical treatment. O'Leary (1932) presents data which indicate that 6 per cent of patients with uveitis have syphilis, that treatment for syphilis brings about material improvement in the uveitis in 83 per cent, and that it affords slight benefit in an additional 28 per cent. The patients with the anterior type of uveitis as a rule respond more favourably. It appears that in a small percentage of cases the etiology of uveitis is syphilis, and that antisyphilitic treatment is of benefit in 61 per cent of these cases of syphilis. In 42 per cent of the cases in which syphilis is not a factor, antisyphilitic remedies are of definite benefit also.

With regard to *gonorrhœa*, the long latency of the infection is of interest. Quite frequently an initial attack, which may be mild, occurs at the time of the arthritis, and thereafter nothing happens for many years. It is not generally recognized that attacks of very great severity and great chronicity are then liable to occur, probably not so much because the infection has taken long to become generalized, but because some anaphylactic element is operative whereby the iris becomes sensitized to the action of the toxin. To overcome this, unusually prolonged vaccine treatment is necessary, otherwise any factor which dislodges a few cocci or their toxins is liable to excite an immediate and violent reaction in the sensitized iris. In this connection a reference to the work of Pelouze (1932) on focal infection prostatitis may be apposite. He holds that in the absence of the gonococcus, an infective prostate is common, occurring in at least 35 per cent of all men above 35 years of age, and in at least 72 per cent with focal infective symptoms. He finds an accompanying prostatitis in association usually with infected teeth and tonsils, to which it is secondary, having no relation to venereal infection. Eye conditions due to focal infection are, he holds, kept active by this means after removal of the primarily responsible teeth or tonsils, and the presence of the factor can be elicited in the great majority of cases by exciting a focal reaction by digital manipulation of the gland.

Non-typical *tuberculous iritis* is an exceedingly vague clinical entity, and the opinion is gaining ground that in its essentials it is a demonstration of an allergic state. The case for this has been stated recently by Williamson-Noble (1932). It will be remembered that immunity is a reaction which leads to the death of the bacilli and, if they are all killed, to the cure of the disease. Unfortunately, however, when the bacillus dies, the proteins which it contains are liberated, and if the patient is allergic they cause various reactions according to the sensitivity of the patient and the amount of protein liberated. If the patient is not allergic, nothing happens, but if he is, the relatively bland products of the breakdown of tubercle bacilli are converted into powerful irritants and poisons without any apparent gain to the organism in the way of immunity. Tissue necrosis is probably almost entirely the result of allergic hypersensitiveness to tuberculo-protein, though the formation of tubercles does not appear to be a reaction of this type. This may be shown by the observations that the formation of tubercles can be brought about by a lipid extracted from the bacillus, which lipid does not of itself produce any allergic changes. For the production of allergy it is necessary to use whole bacilli, and it appears that it has not yet been possible to extract from them the true sensitizing antigen.

Allergy, therefore, seems to be a very real thing, and its occurrence accounts for the mild attacks of what would clinically be termed non-tuberculous iritis. It is conceivable, for example, that a healed focus of old tuberculosis may light up as a result of extreme exhaustion. The tubercle bacilli are disintegrated, as the patient has acquired immunity, but in their disintegration they set free

tuberculo-protein. Unfortunately the patient is also allergic and therefore develops the so-called tuberculide iritis.

It appears from these observations that tuberculous disease of the eye is probably a good deal commoner than most ophthalmologists imagine, and that, far from being the malignant and destructive type of lesion usually described, it may assume relatively benign forms. Moreover, some cases may not be due to actual lodgement of tubercle bacilli, but may merely represent the allergic reaction of the eye to the presence of tuberculo-protein in the blood. Though such an hypothesis has not yet met with universal acceptance, there is no question that a number of cases of obstinate infection of the uveal tract and of the cornea do better with tuberculin than with any other form of treatment.

TREATMENT.—So far as treatment is concerned, the first and obvious course is the treatment of the primary cause. In the case of syphilis, gonorrhœa, and tubercle, the course is clear; it is in the case of 'focal infection' and non-specific lesions that difficulties crop up. If a patient has a gross source of focal sepsis to which his symptoms can reasonably be attributed, then there seems little doubt that he had better be rid of it, not only for the sake of his ocular lesion, but of his general health. There is no doubt, however, that of recent years this practice has been grossly overdone. Time and again we see patients whose teeth have been extracted, whose tonsils have been removed, whose sinuses have been opened up, whose appendix has been taken out, whose colon is being irrigated, whose prostate has been massaged (or whose endometrium has been scraped)—all for the sake of an iritis which goes placidly on in complete disregard of the mutilation for which it is responsible. It sometimes seems as if the beneficial results are insignificant in comparison with the sacrifices involved. It must be admitted that mass surgery of this type is in reality based on ignorance of the cause of iridocyclitis; nor should it be forgotten that the legitimate practice of medicine should not be mistaken for laboratory experimentation.

Other methods of treatment are receiving considerable exploitation. Of the 'specific' remedies, **Vaccine Therapy** has shown no revolutionary changes in recent years, despite the form—'detoxicated', 'sensitized', and so on—in which the antigen may be presented to the patient. Extremely valuable in some cases, as valueless in others, the method must still be regarded as entirely empirical. Considerable help may be obtained from the newer **Exotoxin-sera**, particularly in virulent streptococcal infections, but it is as yet too early to assess their value. The pendulum has, in fact, tended to swing round in the opposite direction, and in the failure to overcome infective processes by an attack directed specifically upon the disease itself, therapeutists have stressed the hypothesis that the mechanism of immunity is generic rather than particular, and that it may therefore be activated by a stimulus quite different from the infective agent. What would appear to be the remarkable allergic quality of many end-ocular inflammations would seem to make the eye suitable territory for such working, and certainly the dramatic results obtained from time to time by this method of therapy lend colour to its claim. It is supposed that the protective power of the plasma resides in protein particles circulating in this medium, and that by the injection of **Foreign Proteins** the mechanism of immunity receives a fillip which excites it to renewed activity, allowing it to overcome any deleterious agent against which it had hitherto been unable to fight successfully. About any of these fundamental things nothing is known: we only know that such methods of protein shock do frequently seem to tip the balance in many cases of ocular inflammation—particularly chronic inflammations. For this, numerous

preparations, all with large molecules, are almost daily appearing on the market, many of them labelled with quite extravagant claims: probably the most useful of them is **Milk** or those based on **Peptone Preparations**. It is just possible that it is in this way that many vaccines produce their effect, and, as has already been discussed, it is probable that herein lies much of the good effect of small doses of **Tuberculin** in ocular disease. Because of their (occasional) good results they should not be commended off-hand, but because we are dealing with an infinitely complex and delicate mechanism of the complexities of which we know little or nothing, and to interfere clumsily with which may be followed by disaster, we must exercise caution that we are not merely adding unwisely to the load which the patient is already carrying. It is a question which can only be answered in the light of experience. As Sir Thomas Horder (1932) puts it: "I do not myself find it difficult to visualize a remedial agent which shall expedite the natural course of recovery from an infection. There would often appear to be a lag in this natural process which, quite conceivably, might be overcome by appropriate means. But this raises the question as to whether the patient possesses a reserve in his immunity mechanism which can be called up for our purpose. And it may well be that this is a matter varying considerably in different individuals."

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JAUNDICE IN CHILDHOOD.

Reginald Miller, M.D., F.R.C.P.

A. C. Hampson¹ in a noteworthy address on this subject points out that the staining of the skin, mucous membranes, and conjunctivæ by bile-pigments is always associated with an excess of bilirubin in the blood. As this excess is both constant and early, it may be taken as the measure of the degree of disturbance, and the mechanism of its production is a matter of interest.

Bilirubin is formed from hæmoglobin by the cells of the reticulo-endothelial system, chiefly by those of the spleen, liver, and bone-marrow. The bilirubin so formed is further changed by the polygonal cells of the liver and excreted into the alimentary tract. These two forms of bilirubin can be distinguished by the van den Bergh reaction. That produced by the action of the endothelial cells gives an indirect reaction, and that formed by the action of the polygonal cells gives a direct reaction. The second type, when it accumulates in the blood, is excreted as bile by the kidneys, but the first is rarely so excreted, the urine only containing an excess of urobilin. According to this conception, jaundice may be produced by: (1) Obstruction at any point in the biliary channels, the bile stagnant in the ducts being re-absorbed into the blood-stream (van den Bergh's reaction direct); (2) Disease of the polygonal cells, in which bilirubin, unchanged by and not excreted by these cells, passes into the general circulation (indirect reaction); (3) Disease of the liver, which may in one part involve the polygonal cells, and in another cause obstruction of the bile-channels (biphasic reaction); and (4) Excessive hæmolytic, with the production of more bilirubin than the polygonal cells can change and excrete, the excess passing into the general circulation (indirect reaction).

The years of childhood must be reckoned as times when the liver is comparatively easily affected by toxins, though this is to some extent counter-balanced by its greater capacity for repair.

Jaundice of the Newborn.—This may be divided into the following groups: (1) Icterus neonatorum (physiological jaundice); (2) Icterus gravis neonatorum; (3) Congenital obliteration of the bile-ducts; (4) Syphilitic; (5) Toxic.

Icterus Neonatorum.—It has long been held that this is only a physiological condition, owing to the fact that, apart perhaps from some drowsiness, the baby shows no sign of illness. It is now known that all newborn infants show an excess of bilirubin in the blood. Hampson has in a large series of analyses confirmed this fact previously found by Bang² and Yippo.³ The question is why this should be so. Hampson points out that in intra-uterine life the fœtus has two methods of excretion of bile, one through its own liver and alimentary tract, and the other through the placenta into the circulation of the mother. At birth the latter route becomes no longer available, and it may be that the liver takes some little while to assume its full function. Hampson found in a case of paroxysmal hæmoglobinuria which could be controlled experimentally that a very short while sufficed for the appearance of an indirect van den Bergh's reaction, although hæmoglobin did not appear in the urine for six hours. As the coloration of the skin does not usually appear until the second day of life in icterus neonatorum, there is every reason to think that the cause of the jaundice is post-natal. After birth there is a considerable amount of hæmolysis, which also accounts for the increased bile-pigment in the blood of the newly-born. Hampson has tried to prove that this hæmolysis is due to a difference in acidity between the red cells and the plasma, and thinks that further investigations will confirm this explanation of icterus neonatorum.

Icterus Gravis Neonatorum.—Hampson excludes from this group the cases of jaundice arising from umbilical sepsis, and deals only with the type which tends to occur in successive members of a family, although the first-born frequently escapes, and is a very fatal condition unless treated. The jaundice usually appears in the first twenty-four hours, and is occasionally present at birth. There are increasing lethargy, wasting, and anæmia, and ultimately hæmorrhages occur. The liver and spleen are not usually enlarged, and the temperature is commonly below normal. Death occurs in about three weeks. It is not quite clear if all these cases are absolutely identical. It is probable that they are a composite group. One type at least appears to be separable, that associated with severe maternal toxæmia. Excluding this, icterus gravis neonatorum appears to be due to an excessive hæmolysis, differing only in degree from the simple cases in the class already described. The treatment, introduced by Hampson, consists of intramuscular injections of **Human Serum** for three or four days. The dose given is 15 c.c. **Mercurial Inunction**, although the condition has nothing to do with congenital syphilis, is of additional value in Hampson's opinion. By means of these lines of treatment the death-rate in this disease has been greatly reduced. Hampson claims 23 successes out of 24 personal cases.

Sequels have been reported. Cerebral diplegia has been recorded by Spiller,⁴ and Hampson has met it as a sequel in congenital obliteration of bile-ducts as well as in icterus gravis neonatorum. It is an interesting fact in this connection that even in the physiological jaundice of the newborn the cerebrospinal fluid and the brain nuclei are stained in a way not seen in other forms of jaundice. F. Braid⁵ has also met as a sequel to icterus gravis severe mal-development of the bones. This is as yet apparently a unique case, but it must be remembered that there are now more survivors from this disease than formerly.

Congenital Obliteration of Bile-ducts.—Here the jaundice usually is seen by the second day of life and is progressive. The liver is enlarged and hard, and the spleen is also large. The stools are, after the meconium has been got

rid of, colourless in most cases. The gall-bladder may be enlarged. There is a tendency for hæmorrhages to occur, but the child keeps in surprisingly good condition at first, and then dies rapidly from wasting, fever, and convulsions. Syphilis plays no part in the production of this condition. It is not known if congenital obliteration of the bile-ducts is merely a congenital anatomical error or the response to some maternal toxæmia in intra-uterine life. As regards treatment, Hampson is of opinion that **Mercurial Inunction** is of some value, with or without the use of **Serum** to diminish hæmolysis.

Syphilitic Hepatic Cirrhosis.—Jaundice may be present in this condition but is unusual. The liver is enlarged, rather hard, and often tender, and the spleen is enlarged. Other signs of congenital syphilis are usually present. **Anti-syphilitic Treatment** should be given.

Toxic Jaundice.—Jaundice in the young infant may be associated with sepsis of the umbilicus or with alimentary infection (cf. Winckel's disease and Buhl's disease). Such infants are usually extremely ill with cyanosis of the extremities and a great tendency to hæmorrhages. The condition rapidly progresses to coma and death.

Jaundice in Older Children.—

Epidemic Infective Jaundice ('Catarrhal' Jaundice).—The old view that so-called catarrhal jaundice is due to an ascending infection of the ducts from a gastro-duodenitis falls more and more into disfavour. The alternative hypothesis is that it is a hepatitis due to some unknown infection, occurring sporadically or in epidemics. Viewed thus it is seen to have an incubation period of fourteen to twenty-eight days, an autumnal seasonal incidence, an age incidence of from 5 to 10 years especially, and to have the power of conferring a lasting immunity from fresh attacks. The type of child with 'cyclical vomiting' seems peculiarly liable to this disease, and adults show much more immunity against it than children. The general features of an attack are well known. There is a slight and transient fever, followed by malaise, anorexia, nausea, and vomiting. Jaundice then appears, first in the sclerotics. The liver becomes enlarged and tender; this is probably due to vascular engorgement and usually precedes the diminution in the flow of bile, and the degree of enlargement bears no direct relationship to the depth of the jaundice. The urine becomes dark with bile, and the motions become pale from the diminished bile and excess of fat in them. The spleen is enlarged in a proportion of cases. Van den Bergh's test is at first a direct positive and later biphasic.

The picture of this disease is therefore suggestive of a hepatitis, and this has been confirmed by sections of the liver taken from living patients and from others who have died from some other cause. As a rule the course of the disease is uneventful: the jaundice fairly rapidly clears up, though the liver may remain enlarged, but no longer tender, for some weeks. Rarely the case may take on grave characters and pursue the course of an acute necrosis of the liver. Whether there is any real difference between the usual mild cases and the rare fatal cases, except in degree, is a difficult point; and it is suggestive that in the Gothenburg epidemic of 1924-6 there was an increase in the number of grave cases and this increase was confined to the epidemic area.

Other Conditions.—Amongst other conditions with which jaundice may be associated in older children, Hampson mentions the following: mumps, cholangitis, cirrhosis, hæmolytic jaundice, pneumonia, typhoid, syphilis, heart failure, and such rare conditions as gall-stones and Wilson's disease.

REFERENCES.—¹*Brit. Med. Jour.* 1931, ii, 932; ²*Hospitaltidende*, 1915, lviii, 637; ³*Zeits. f. Kinderheilk.* 1913, vi, 666; ⁴*Amer. Jour. Med. Sci.* 1915, cxlix, 346; ⁵*Arch. of Dis. Childh.* 1932, Dec.

JAUNDICE, HÆMOLYTIC. (*See HÆMORRHAGIC DIATHESSES.*)**JAUNDICE, INFECTIVE.***J. D. Rolleston, M.D., F.R.C.P.*

EPIDEMIOLOGY.—Y. Chaigneau and M. Chauzy¹ describe an epidemic of mild jaundice which occurred during 1929 in a Senegalese regiment at Tunis. The cause of the outbreak could not be discovered. Enteric fever could be excluded, as there was no epidemic of that disease or even a sporadic case at that time. Of the 34 cases which constituted the epidemic the first was a sporadic case in May, and the rest occurred from August to December. With the exception of two French officers, all the patients were natives, whereas in an epidemic in 1925 the white soldiers were chiefly attacked. In 22 the disease lasted a week, in 5 a fortnight, and in 7 three weeks or more. Two had a relapse.

R. Jorge² describes a water-borne epidemic of hæmorrhagic jaundice which occurred in a Lisbon district during the summer of 1931. There were 126 cases between Aug. 10 and Sept. 5, and sporadic cases continued to appear until December. Some cases were not notified, and others escaped medical attention owing to the mildness of the symptoms: 94 cases were males and 32 females. Most of the cases occurred between the ages of 20 and 40 and 40 and 60. There was no case under 10 years. All professions were represented. The fatality-rate was high—24·6 per cent, 26 deaths occurring in men and 5 in women. The epidemic was found to be due to the water of a drinking fountain infected by rats which were *Leptospira* carriers. No organisms were found in the urine, and inoculation of guinea-pigs was negative, but the clinical diagnosis of spirochætosis icterohæmorrhagica was confirmed by Pettit's agglutination test, the serum of 10 convalescents yielding positive results with London and Lisbon strains of *Leptospira icterohæmorrhagica*.

SYMPTOMS.—A catarrhal form of spirochætal jaundice is described by M. Brulé, J. A. Lièvre, and Tsatsaronis,³ in two men aged 19 and 26, in whom the disease closely resembled ordinary catarrhal jaundice in its apyrexial course after the jaundice had appeared. In one case, however, the early development of arthritis and the occurrence of transient purpura suggested the use of the serum test, which showed the true nature of the disease, while in the other patient the intense myalgia, orange tint of the jaundice, and conjunctival injection suggested the diagnosis of spirochætosis icterohæmorrhagica, which was confirmed by the serum test. Convalescence was protracted, being characterized by considerable asthenia and severe anæmia which lasted more than two months.

REFERENCES.—¹*Ann. de Méd. et de Pharm.* col. 1931, 337; ²*Bull. Off. internat. d'Hyg. publ.* 1932, 88; ³*Bull. Soc. méd. Hôp. de Paris*, 1932, 520.

JOINTS, SURGERY OF.*E. W. Hey Groves, M.S., F.R.C.S.*

Shoulder-joint.—In paralysis of the muscles of the arm, usually caused by obstetrical or birth palsy, there occurs extreme internal rotation of the arm, so that when the hand is lifted to the face the back of the hand presents to the mouth. S. Kleinberg¹ discusses the treatment of this condition and narrates 10 cases in which he has carried out a new operative method devised to meet it. Hitherto the methods which have been applied have been either division of the tendons of the great pectoral and subscapular muscles, or osteotomy of the humerus. He considers that both these methods give unsatisfactory results or that the benefit is only temporary. Kleinberg's method consists in exposure of the shoulder-joint by a vertical incision through the deltoid, and separation of the capsule of the joint together with the tendons inserted into the great tuberosity. The separation of these structures is best

effected by chipping off a flake of bone from the surface of the great tuberosity. The humerus is then forcibly rotated outwards and the tendon of the subscapular muscle divided. The capsule is sewn up whilst the bone is held in the over-corrected position and the arm is put up in plaster.

Hip-joint.—Fixation of the hip-joint for conditions of dislocation or unsatisfactory ankylosis has always been a problem of some difficulty: the actual joint itself is so deeply placed and its surfaces inaccessible for plastic operation. For these reasons, and also in order to avoid reawakening a latent infective arthritis, the modern tendency has been to produce fixation of the hip-joint by extra-articular methods. That most commonly used, and that which is likely to remain the best method of fusion, consists in cutting a graft from the region of the great trochanter and sliding it upwards so as to become attached to the outer surface of the ilium. But H. C. Trumble² has devised an ingenious method which might be of use in cases where the region of the trochanter is unhealthy. He takes a specially curved graft from the tibia and implants this into the back of the hip, one end being implanted in the ramus of the ischium and the other into the shaft of the femur (Fig. 41). This method is not likely to be used often on account of its complexity, but it has two definite advantages: (1) It is right away from the joint itself; and (2) It forms a powerful strut which acts at great mechanical advantage in maintaining abduction of the leg.

Knee-joint.—

Internal Derangement of the Knee.—The problem of the complete exposure of the knee-joint still exercises the ingenuity of surgeons. The old method of chipping off the tubercle of the tibia and turning up a large horseshoe-shaped flap containing the patella still remains by far the most effective method of obtaining a complete view of the interior of the joint; but it has the drawback of dividing so many important structures. For this reason attempts have been made to get a view of the joint by splitting the patella in a vertical manner and turning the two lateral halves aside; or by a curved incision from the inner side of the patella the whole knee-cap is drawn outwards. Both these methods involve great tension on the patella and its ligaments, which makes exploration of the lateral recesses of the knee very difficult. H. B. Devine³ has suggested a method which overcomes this difficulty. A curved transverse incision is made, and the patella is divided by a vertical incision into a deep part, which remains attached to the quadriceps, and a superficial part, which remains attached to the patella tendon. These two parts of the bone are turned upwards and downwards respectively and the cavity of the knee-joint is freely exposed. At the conclusion of the operation the front and the back of the patella come to lie naturally in contact with one another and do not require any special fixation by sutures. (*Plate XXVII.*)

In many cases the chief difficulty of getting at the cavity of the knee-joint consists in a proper exposure of the internal semilunar cartilage. In France and Italy it is common practice to make a long transverse incision round the head of the tibia on the inner side and to divide all the structures of the capsule and internal lateral ligament. In this country and in America, however,

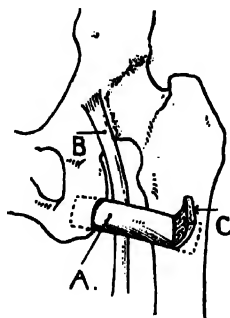


Fig. 41.—Diagram showing fixation of hip-joint by graft from tibia. The graft (A) is shown in position, one end being inserted into a cleft in the tuberosity of the ischium, the other into the medullary cavity of the femur through a trap-door opening (C). The trap-door, hinged on the periosteum at its lateral margin, is shown open. B, Sciatic nerve. (Re-drawn from 'The Australian and New Zealand Journal of Surgery'.)

preservation of the internal lateral ligament is regarded as of cardinal importance.

A. G. Timbrell Fisher⁴ has suggested a very convenient method of getting complete exposure of the internal cartilage without sacrifice of the lateral ligament. He begins by making a curved incision from above downwards and inwards. Through this incision the front part of the joint can be inspected, the anterior part of the meniscus can be seen and removed, and in some cases the posterior part of the cartilage can be extracted through the same incision. But if it is impossible to see or deal with the hinder part of the cartilage, the curved incision is extended backwards so as to expose the internal lateral ligament and the posterior part of the internal tuberosity of the tibia.

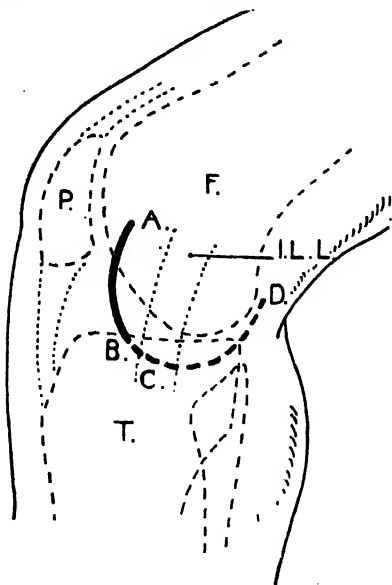


Fig. 42.

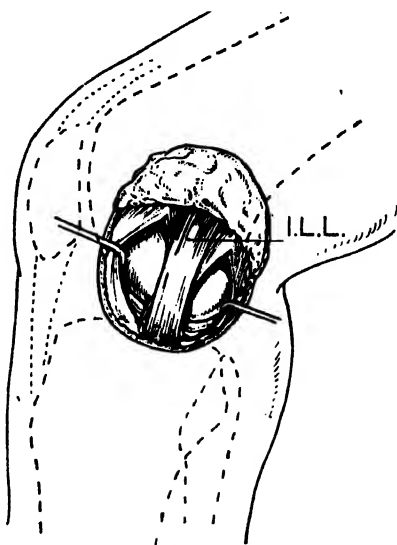


Fig. 43.

Fig. 42.—Method of approach to the interna semilunar cartilage. The skin incision. A. B., First skin incision; C. D., Extension of incision to expose posterior compartment of joint; I.L.L., Internal lateral ligament F Femur; P, Patella; T, Tibia. (After Timbrell Fisher.)

Fig. 43.—Flap turned back and capsule incised, exposing the joint and internal semilunar cartilage on either side of the internal lateral ligament (I.L.L.). (After Timbrell Fisher.)

Through this part of the incision the posterior cornu of the meniscus can be removed. (Figs. 42, 43.)

It not infrequently happens that a patient is operated upon more than once for a supposed derangement of one of the semilunar cartilages. It is commonly thought that if on the occasion of the second operation a cartilage is found in place the former operation had failed to remove it. A. Gibson,⁵ however, has made the very interesting observation that the semilunar cartilages have a definite power of regeneration. This is founded upon both clinical and experimental evidence. In the first place he operated upon and removed a cartilage from a patient who had had a similar operation some time previously. In this case there was no doubt of the removal of the cartilage in the first instance. The cartilage removed at the second operation had the outward appearance of a normal meniscus, but microscopical examination showed it to consist of simple fibrous tissue without any cartilage cells. In order to

confirm the possibility of this regeneration Gibson operated upon two dogs, removing one of the semilunar cartilages from each. In both cases the cartilage was almost completely re-formed, but consisted of simple fibrous tissue without cartilage cells.

Tuberculous Knee.—At one time excision of the joint constituted the routine treatment of all cases of tuberculous knees. It was, however, observed that the operation gave very unsatisfactory results when done in growing children. And furthermore the success of conservative methods in open-air sanatoria seemed to suggest that operative methods were often unnecessary. But the experience of recent years has shown that there is a definite indication for conservative treatment on the one hand and for operative treatment on the other, and that there is no justification for taking an extreme view which would exclude either the one or the other. It is a most regrettable fact that many general surgeons of to-day advise amputation for tuberculous knees, apparently not realizing the value of excision in saving many a useful limb.

P. Korney⁶ utters a timely warning against placing too great reliance upon purely conservative methods. Such methods are very likely to result in painful or deformed limbs, or alternatively to require the indefinite use of a walking splint. He suggests that conservative measures—that is, rest and sanatorium treatment—should only be used during the active stage of the disease, and that in adults when the quiescent stage has been reached resection should be carried out. After this a walking splint is used for a year to eighteen months. He reports good results in 29 out of 30 cases treated by this method.

G. R. Girdlestone,⁷ in opening a discussion on tuberculous knee, presented collected opinions from many of the leading orthopædic surgeons at home and abroad. From the point of view of anatomy and pathology he distinguishes

three types. The first is the extra-articular focus, which may possibly be treated and cured without opening the joint. In the second there is an articular focal lesion which opens in or near the joint. This will inevitably lead to destruction or ankylosis of the joint, and therefore in adults should



Fig. 44.—Skiagram of excision of knee-joint, illustrating minimal removal of bone in a boy aged 13. (Figs. 44, 45 by kind permission of the 'British Journal of Surgery'.)

always be treated by excision. The third type is the non-focal or synovial disease. This shows very little in the X-ray except decalcification of the bone and blurring of the joint cavity. It is in this type of disease, which most commonly occurs in children, that there is the strongest indication for simple **Conservative Treatment**. The author gives an account of no fewer than 9 cases of such disease occurring in children between the ages of 2 and 12 in whom recovery occurred with a normal movable joint. In these cases the knee had been fixed for periods varying from two to six years, and the period of recovery after splinting was from two to six years.



Fig 45.—Caliper and guarding plaster. Note suspensory strap from caliper ring to buckle fixed in plaster

It is impossible to get over the great difficulty which occurs in the diagnosis of some of these cases. Neither an arthrotomy nor injection of a guinea-pig will afford an infallible test; neither will the result of a short period of rest. Many a mild case will subside after a short period of rest and will then flare up again when actively exercised. Therefore in doubtful cases a prolonged period of observation, extending over a year or two, should be employed. In all young adults and grown-up patients—that is, between the ages of 15 and 50—**Excision** should be the method of choice. Girdlestone advises against sawing the ends of the bone by a flat section. He removes the cartilage from both femur and tibia by a curved plane in the natural line of the joint (Fig. 44). By this method much less of the bone is sacrificed, and when the limb is put up the curved section will allow the angle to be chosen according to requirements. The leg is put up in a plaster spica at the time, and this is followed by the use of a caliper and guarding plaster which enables the patient to walk (Fig. 45). Amputation of the leg should only be done when septic

sinuses exist or when the patient is suffering from some other serious disease.

A. Mezzari^a makes an interesting criticism of some of the more recent methods of treating tuberculous knees. The chief of these is that associated with the names of Robertson and Lavalle, in which bone-pegs are driven into the articular ends of the bone with the idea of promoting a reactive hyperæmia. Mezzari declares that more than 50 per cent of cases treated in this manner result in failure. His general rules about treatment are in close agreement with those formulated by Girdlestone—that is to say, synovial disease and the age of childhood are indications for conservative treatment, whereas the disease of the bone in adult age requires resection.

Fusion of the Knee in Infantile Paralysis.—The treatment of flail-knee associated with infantile paralysis is a matter of some difficulty. Only in a very few cases is control of the knee to be obtained by means of tendon transplantation. For the rest, where there is no control over the knee movements, a choice must lie between the constant wearing of a brace or a fusion operation. The choice may be made by the patient himself, who becomes weary by frequently having to have the brace adjusted or repaired. The main

argument against the fusion of the flail-knee is that the patient cannot tuck the leg under him when sitting in a public conveyance. M. Cleveland⁹ gives a very comprehensive account of 154 cases in which the knee-joint had been fused for poliomyelitis. The common age at which the operation is done is between 15 and 16. The cartilage is removed from both bone-ends, and the patella, which may have to be completely detached, is mortised in between the femur and the tibia. Eight weeks after the operation weight can be borne on the limb, and after a further year or so the brace can be dispensed with altogether.

Ankle-joint.—It frequently happens that the ankle suffers as a result of trauma or some chronic infection and becomes so painful that the patient cannot use it for walking. Fixation of the ankle-joint by arthrodesis is not an easy matter. In the first place removal of the cartilaginous surfaces can

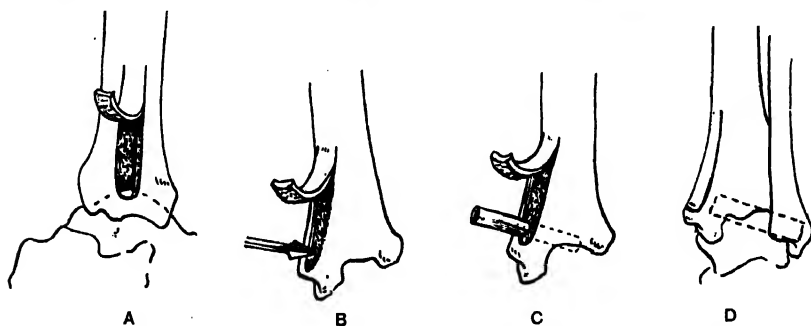


Fig. 46.—Fixation of ankle-joint by bone key. A, Exposure of the line of the joint by chiselling up a bone flap; B, Drilling a hole through the line of the joint; C, Inserting a locking-key of bone D, The key inserted and the bone flap replaced. (After Galland.)

only be done after disarticulation, and in the second it is difficult to obtain bony union. M. Galland¹⁰ has devised a method of bone-grafting which in principle consists in driving a piece of bone through the line of the joint so as to act as a locking key (Fig. 46).

(See also TALIPES.)

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KALA-AZAR.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY.—A valuable historical summary of researches on the transmission of kala-azar has led C. M. Wenyon¹ to conclude that the close relationship between the distribution of *P. argentipes* and both kala-azar and oriental sore in various countries, taken with the development of the Leishmania of both diseases in such sand-flies and the occasional transmission of kala-azar experimentally by their bites, leaves little doubt that this insect is the carrier of the disease, in spite of full proof being still lacking. Infection through the skin by the flagellate stage escaping during feeding from the insect and entering through abrasions is also a possible mode of infection, and increased susceptibility due to other debilitating diseases may play a part.

D. B. Blacklock and E. M. Lourie² have succeeded in proving by culture the viability of Leishmania flagellates passed in the fæces of bugs fed on infected subjects. H. E. Short, R. Smith, and C. S. Saminath³ have infected by the

oral route one of two Chinese hamsters fed on emulsions of liver and spleen of kala-azar animals, but three other animals fed on infected *P. argentipes* gave negative results.

L. E. Napier and C. R. Das Gupta⁴ record an important epidemiological inquiry in rural Bengal—near Calcutta—which has extended over six years, during which at least 98 per cent of the cases of kala-azar in a group of villages with a population of over 5000 were kept under observation and treated, and house-to-house inquiries were made with the help of a local mission. The number of cases yearly from 1925 to 1930 were respectively 121, 127, 75, 30,*12, and 3, a total of 387, i.e., an incidence of 75·64 per 1000. The remarkable reduction proves that by systematic treatment of almost all the cases of the disease kala-azar was practically stamped out, although it was found in undiminished numbers in surrounding untreated control villages. About one-third of the cases were found to have originated simultaneously in the infected houses, and secondary ones usually appeared after about a year. An incidence of more than double in children as compared with adults is attributed to the greater susceptibility of the former, especially those of 8 to 10 years. Christians were affected nearly twice as much as Hindus, largely owing to their inferior social conditions and environment. No less than 5 per cent of the treated patients subsequently showed clinical signs of persisting skin infection, and they are considered to be an important source of infection. Malarial attacks probably predispose to later kala-azar infection. All the evidence was in accordance with the transmission of the disease through the sand-fly, *P. argentipes*. In a further paper, L. E. Napier and K. V. Krishnan⁵ suggest that on becoming infected with the parasite of kala-azar the subject may suffer from—(1) only a temporary local focus without symptoms, or (2) a temporary visceral infection, which may be followed by a dermal infection or lead to a fatal visceral infection, depending on his susceptibility and resisting powers.

P. Giraud⁶ records finding frequent cases of infantile kala-azar in south-east France in the neighbourhood of Marseilles, where he has seen 80 cases, but he found no infections in 117 dogs whose organs he examined. The disease was usually seen in children, but four cases were in adults. R. Poinso⁷ records notes with photographs of two Marseilles cases in which the liver was much more enlarged than the spleen.

PATHOLOGY.—L. E. Napier and his assistants⁸ describe and illustrate the cytology of the leucocytes in kala-azar and malaria with the aid of intravital staining with a combination of Janus green and neutral red, the technique of which is given. They describe in detail the differential characteristics of the mononuclear leucocytes. G. Shanks and M. N. De⁹ report on the histology of the liver and spleen in 26 cases of kala-azar stained to show the fibrous tissue and reticulum, and only found an increase in these tissues in 20 per cent of the spleens and 30 per cent of the livers. R. Row¹⁰ records positive agglutination with the serum of kala-azar and tropical ulcer cases of *Leishmania* cultures on the surface of solid media in normal saline and killed by chloroform or heat, but he regards the reaction as being of more scientific than practical value in diagnosis. L. E. Napier and J. Henderson¹¹ have studied the erythrocyte sedimentation rate in kala-azar, and they took the average of the readings after one and a half and two and a half hours as the sedimentation index. In controls the mean rate was 13·455 with a standard deviation of 7·101, and in untreated kala-azar cases the figures were 71·820 and 7·509 respectively. The test is not as easily performed as the aldehyde one, so the latter remains the best for diagnostic purposes; nor did it prove of any prognostic significance even when a series of tests were done during treatment. R. N. Chopra and S. G. Chaudhury¹² report further on the prognostic value of the aldehyde reaction

in kala-azar, and state that this is satisfactory if the time of gelation is more than half an hour. C. R. Das Gupta¹³ finds that the aldehyde test gives uncertain results unless its originator's instruction to add a drop of 30 per cent formalin to 1 c.c. of clear serum with subsequent shaking is adhered to.

TREATMENT.—Recent papers deal mainly with the details of the well-established use of antimony preparations. P. Giroud and Mlle. Coulange¹⁴ record good results in the treatment of infantile kala-azar in Marseilles, with 71 per cent of recoveries in these difficult cases, and they prefer either **Sodium Antimony Tartrate** intravenously or **Stibenyl** intramuscularly. L. E. Napier¹⁵ reports his results with five different compounds—namely, **Stibosan**, **Bayer 693** (or **Neostibosan**), **Aminostiburea**, **Urea Stibamine**, and **Stibamine Glucoside**. He concludes that all of them gave good results, but neostibosan was the best and stibosan the least satisfactory. In a series of 254 cases treated by neostibosan, among 217 followed up, complete cure was obtained in 90.08 per cent; 2.30 per cent died, and 5.99 per cent relapsed; or, if cases dying from other causes are included as failures, the cures amounted to 87.78 per cent—a remarkable achievement in a disease with a former mortality of from 80 to 95 per cent. No immediate criteria of cure have been established, and early cases do not do better than late ones, but rather the reverse. T. C. Boyd, L. E. Napier, and A. C. Roy¹⁶ report on the distribution of antimony in the tissues of monkeys injected intravenously with an antimony compound in the form of Bayer 693, and they find no organ has any marked affinity for the drug, which is excreted mainly through the kidneys. P. and U. Brahmachari¹⁷ report further cases of kala-azar to show that intensive courses of injections of urea stibamine administered daily or every other day give good results. M. D'Oelsnitz¹⁸ discusses the diagnosis and treatment on the basis of 4 adult and 40 infantile cases seen in the South of France, in which he got good results with the organic antimony preparations intravenously, with a recovery rate of nearly 80 per cent.

REFERENCES.—¹*Trans. Roy. Soc. Trop. Med. and Hyg.* 1932, March 31, 319; ²*Ann. Trop. Med. and Parasitol.* 1931, Aug. 13, 359; ³*Ind. Jour. Med. Research*, 1931, July, 351; ⁴*Ibid.* 295 and 343; ⁵*Ind. Med. Gaz.* 1931, Nov., 603; ⁶*Presse méd.* 1931, Aug. 15, 1213; ⁷*Ibid.* Dec. 30, 1920; ⁸*Ind. Med. Gaz.* 1932, March, 135; May, 251; ⁹*Ind. Jour. Med. Research*, 1931, Oct., 457; ¹⁰*Ibid.* 641; ¹¹*Ibid.* 691; ¹²*Ind. Med. Gaz.* 1932, May, 260; ¹³*Ibid.* 1931, Sept., 500; ¹⁴*Presse méd.* 1932, Feb. 3, 178; ¹⁵*Ind. Jour. Med. Research*, 1932, Feb., 705 and 719; ¹⁶*Ibid.* 1931, July, 285; ¹⁷*Jour. Trop. Med. and Hyg.* 1931, Aug. 15, 263; ¹⁸*Presse méd.* 1932, May 11, 756; May 25, 832.

KERATODERMA BLENNORRHAGICUM. (See GONORRHOEA.)

KIDNEY, CYSTS OF.

Sir W. I. de C. Wheeler, *F.R.C.S.I.*

Solitary cysts of the kidney are comparatively rare. Various views are held with regard to etiology. The cyst arises in the cortical portion of the kidney. As it enlarges, the renal parenchyma is flattened out and covers the cyst wall. The fluid contents of the cyst may contain traces of urea and blood. The majority arise in the upper pole. Symptoms vary or may be absent.

In a case recently under the care of the reviewer there was painless hæmaturia and an enlarged right mobile kidney. Pyelograms revealed the upper calices occluded and deformed, and also a slight hydronephrosis on the left side. At operation the cyst was about the size of a tangerine orange. On exposure the kidney was found quite normal except for the upper pole, which was involved in the cyst. It was removed by a wedge-shaped incision into the kidney substance. The cut renal surfaces were brought together by interrupted Halsted's stitches. The stitches were prevented from cutting through

by the interposition of small portions of detached muscle, after the manner of Walters. Pyelograms after operation demonstrated the restoration of the upper calices to something approaching normal. The patient made an uneventful recovery.

A. Fullerton¹ stated that up to the time of writing (1926) only 99 cases had been reported.

REFERENCE.—¹*Brit. Jour. Surg.* 1927, xiv, 629.

KIDNEY, RUPTURED. (See also KIDNEY, SURGERY OF.)

A. Rendle Short, M.D., F.R.C.S.

H. Dodd¹ (Ilford) reports three cases of abdominal nephrectomy for ruptured kidney. Two did well, one died. The latter had a ruptured spleen in addition to a torn kidney. In the two successful cases there was no free blood in the belly, but a big retroperitoneal hæmatoma was present. A transverse incision is advised, and the loin should be elevated by a pillow or bridge. The advantages of the abdominal approach are the ease with which one can get access to the renal vessels, and the exclusion of injury to other viscera.

REFERENCE.—¹*Brit. Med. Jour.* 1932, ii, 54.

KIDNEY, SURGERY OF. (See also above; and PYELOGRAPHY; UROLOGICAL SURGERY IN CHILDHOOD.)

Hamilton Bailey, F.R.C.S.

Renal Calculi.—E. L. Pierson¹ inquires into the unsatisfactory results of the treatment of renal calculus. Prominent among the causes is *delay*. The medical profession has been insistent upon teaching the public the necessity of treating malignant disease early, but has allowed them to consider renal calculi as comparatively unimportant. Yet even early treatment of cancer is too often unsuccessful, whereas the *early* treatment of renal calculi usually produces brilliant and lasting results.

F. Legueu² reviews his extensive experience in the treatment of renal calculi. Providing the other kidney is sound, if the stone is large and involving several calices, **Primary Nephrectomy** is advised. The alternative—**Nephrolithotomy**—may result in the leaving of fragments of stone behind, and there is always the danger of hæmorrhage. Legueu finds that the electric cutting knife is the best instrument for incising renal parenchyma, and he considers this instrument almost a necessity when operating upon a calculus in a single kidney.

In cases of severe infection primary nephrectomy is dangerous. In these **Nephrostomy** is indicated, and when necessary a subcapsular nephrectomy can later be carried out with safety. Legueu's mortality figures are as follows:

Mortality rate of primary nephrectomy	..	3.5 per cent
" " secondary nephrectomy	..	1.8 "
" " nephrolithotomy	..	7.9 "
" " pyelolithotomy	..	2.9 "

In patients with a solitary kidney the operation of nephrolithotomy is no more difficult, nor are more dangers encountered, than in patients with two kidneys (J. R. Dillon and J. G. Jones³).

J. Hellstrom⁴ has on previous occasions attempted to show the importance of chronic staphylococcal infections in the formation of renal calculi. He emphasizes that staphylococci decompose urea and favour the precipitation of ammonium magnesium phosphate. He has found staphylococci in the nuclei of 29 out of 55 renal stones examined. J. S. Eisenstaedt⁵ finds that certain bacteria, especially those belonging to the *Staphylococcus albus* group, are potent urea-splitters and produce alkaline urine.

Stones are practically unknown in the rabbit's kidney. H. F. Helmholz⁸ found three calculi in the renal pelvis of a rabbit which had received a daily intravenous injection of 2 c.c. of the filtrate of virulent staphylococci.

In the genesis of stone there are three agents which play a part—dietetic, infective, and physico-chemical. In India the star part is played by diet. (R. McCarrison⁷.)

Nephrostomy.—The indications for nephrostomy can be summarized as follows: (1) Acute obstruction of both ureters, particularly in cases of calculus anuria; (2) Hydronephrosis, or infected hydronephrosis where the cause may be removable but drainage of the kidney is essential; (3) Certain cases of renal calculi; (4) Possibly in certain cases of irremovable chronic obstruction to both ureters.

H. Cabot and W. W. Holland⁶ consider that nephrostomy is preferable to pyelostomy in most instances. Cabot's technique for this operation is one which is destined to become a standard method, for it is simple and the most atraumatic which has been described up to the present. The operation is so clearly demonstrated in *Plate XXVIII* that a description is unnecessary, except to emphasize that a uterine sound or a long malleable probe, and a winged catheter, are the only essential special equipment required.

M. Zondek,⁹ discussing the operation of nephropylotomy, points out that if an incision in the renal pelvis is extended directly into the renal tissues themselves, there is a great danger of wounding a large branch of the renal artery. If an incision in the pelvis is insufficient, a second incision should be made well away from the hilus. The point is beautifully illustrated in *Plate XXIX*.

Calculus Anuria.—Professor Jeanbrau¹⁰ advises the following measures. The patient should never be treated in his home. The first thing to do is to distend the bladder with warm water, which sometimes reflexly stimulates renal excretion. If the case is an early one—that is, if the anuria has been present not more than forty-eight hours—conservative treatment should at first be tried. This consists of **Hot Baths, Packs to the Lumbar Region**, and intravenous injection of isotonic **Glucose Solution**. If after a few hours of such treatment the anuria still persists, both **Ureters should be Catheterized** and the catheters left in position while a further last trial of expectant treatment is given. In all cases where renal excretion has not taken place for three days **Nephrostomy** must be performed forthwith. In deciding upon which side nephrostomy is to be performed, Jeanbrau has found the *signe de Legueu* very helpful. (*Signe de Legueu*: Muscular resistance is greater over the kidney last to be obstructed. Such resistance is demonstrable on abdominal palpation.)

H. I. Alapin¹¹ considers that three days is too long to wait before performing nephrostomy. Every case should be operated upon within two days. [This seems to be sound teaching.—H. B.] The important question when to operate in these cases is also considered by G. Komaya and M. Kumaschiro,¹² who stress that one should never take a chance in calculous anuria. *No one is able to tell what the period of tolerance (i.e., before uræmia sets in) will be in any given case, for it varies from twenty-four hours to as many days.* If the obstruction cannot be passed by a ureteric catheter, immediate operation should be performed.

Nephrostomy has lowered the mortality of calculous anuria from 71 per cent to 18 per cent. (Jeanbrau.¹⁰)

H. Rubritius¹³ deals with the disputed question of the *reno-renal reflex*, and he produces some convincing testimony that it is possible for a healthy kidney to stop excreting in sympathy with one which is obstructed or acutely diseased. When other measures fail to restore function, **Decapsulation** is often effective.

Anuria in Acute Nephritis. W. Denk¹⁴ finds that in acute nephritis

with rapidly oncoming oliguria or anuria, **Renal Decapsulation** is a life-saving measure if performed within twenty-four hours of failure of the kidneys to respond to stimulation by medical means. Of 149 cases of decapsulation under these circumstances, 47 per cent were cured and 20 per cent were improved. He also recommends decapsulation in cases of eclampsia if the oliguria or anuria persists in spite of emptying the uterus.

Horseshoe Kidney.—H. S. Jack¹⁵ states that in 26 cases from the Pathological Department of the Bellevue Hospital, the average age was 43, indicating that in this abnormality the expectation of life is curtailed. Jack also reports 4 cases operated upon for disease in one half of the horseshoe. In all, **Heminephrectomy** was carried out. The knowledge that the supposed sound half of the kidney has its own ureter is essential before attempting heminephrectomy. Division of the isthmus with a cautery is recommended.

Nephropexy.—The gentle art of nephropexy is now enjoying a decided renaissance. The majority of surgeons (W. F. Braasch,¹⁶ I. M. Boykin,¹⁷

F. Kidd¹⁸) strictly adhere to the dictum that the operation should only be performed where there is demonstrable evidence of urinary obstruction from this cause. Excretion pyelography is invaluable in determining this point. J. J. Crane¹⁹ divides cases of nephroptosis into three degrees (Fig. 47): (1) First degree when the pelvis rests opposite the 3rd lumbar vertebra; (2) Second degree when the pelvis rests opposite the 4th lumbar vertebra; and (3) Third degree when the pelvis rests opposite or below the 5th lumbar vertebra. He considers nephropexy necessary when the kidney is movable to more than the first degree.

Hydronephrosis.—H. Wildbolz²⁰ advocates **Conservative Operations** for hydronephrosis. Plastic operations on the renal pelvis or a nephropexy to straighten a ureteral kink has enabled him to save the kidney and cure the patient in 25 out of 27 cases. When the renal parenchyma is considerably atrophied and the hydronephrosis is large, nephrectomy is probably more advisable than a plastic operation, unless the other kidney is functioning poorly. (J. K. Ormond.²¹)

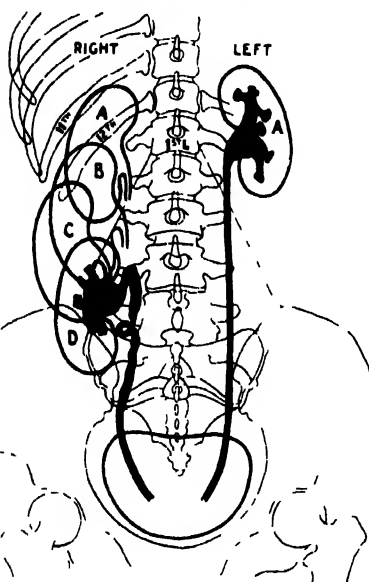


Fig. 47.—Schematic drawing showing the degrees of ptosis of the kidney. A, Normal position; B, First degree nephroptosis; C, Second degree; D, Third degree. (Re-drawn from 'California and Western Medicine'.)

Professor Marion²² considers that plastic operations of all kinds are usually eventually unsatisfactory; but the bulk of evidence^{20, 21, 23, 24} does not support his authority.

Urinary Infections.—**Neotropin*** is a comparatively recently introduced synthetic urinary and biliary antiseptic. Taken by mouth, it readily enters the hepatic circulation and within five hours 75 per cent is excreted in the urine and 25 per cent in the bile. (H. Horsters.²⁵) Neotropin exercises its bactericidal action in acid and alkaline urine, especially in the case of staphylococcal and *B. coli* infections.

* Schering Ltd., 3, Lloyd's Avenue, London, E.C.3.

J. Barr-David²⁶ writes, "A mother to whom I was temporarily administering neotropin for chronic pyelitis had an infant aged 4 months on the breast. The milk became orange yellow and the infant passed urine of a similar shade." This suggests an additional means of treating urinary infections in breast-fed infants.

The pain of pyelitis is greatly relieved by **Pituitary Extract**; $\frac{1}{2}$ or 1 c.c. of the extract is more effective than $\frac{1}{2}$ gr. of morphia. (Draper et al.²⁷)

Staphylococcal Infections of the Kidney.—Attention has been directed to what some consider an important rôle played by staphylococci in the formation of renal calculi. (See **RENAL CALCULI**, p. 252.)

D'Azevedo and Sobringho²⁸ examined 120 cases of infection of the urinary tract. An infection by the coliform bacillus was by far the commonest, occurring in 40 cases. The second commonest type was due to *staphylococcus*—23 per cent. R. N. Nesbitt²⁹ also states that acute staphylococcal infections of the kidney are relatively common. The most frequent lesion is acute staphylococcal pyelonephritis, which runs a stormy but self-limiting course. In only 4 of 48 cases was operation necessary. Of the 4, 3 had a perinephric abscess and 1 a small cortical abscess. There was 1 death in the 48 cases and this was attributed to staphylococcal septicæmia.

Perinephric Abscess.—This is frequently overlooked for several weeks. H. A. Fowler and H. N. Dorman³¹ summarize the leading features of this condition as follows: (1) A history of peripheral infection [this is often lacking—H. B.]; (2) An unexplained pyrexia; (3) High leucocytosis; (4) Costovertebral tenderness.

L. G. Rigler and M. H. Manson³² find that X-ray examination is often helpful in arriving at an earlier diagnosis. The most important X-ray signs are loss of the normal psoas shadow, obliteration of the kidney outline, and upward displacement of the diaphragm.

Carbuncle of the Kidney (*Metastatic Staphylococcal Abscess of the Kidney Cortex*).—There have been several papers on this condition.³³⁻³⁶ The diagnosis is often more difficult than that of perinephric abscess, for which the condition may be mistaken and with which it is occasionally associated. The carbuncle is usually situated towards the upper pole, although in Ljunggren's case³⁴ the lower pole was mainly affected. In nearly all the reported cases nephrectomy has been performed successfully, but the consensus of opinion is that **Partial Nephrectomy** should be practised when the carbuncle is localized to one pole. Like perinephric abscess, these cases present pyrexia, and by a process of elimination and signs of localized tenderness in one or other loin, the kidney is suspected. Sometimes pyelography is helpful in demonstrating the disease, but, curiously, pyuria is seldom in evidence, although staphylococci have been found in the urine from the affected kidney in a few instances.

Renal Tuberculosis.—T. Hryntsch³⁷ finds that *instrumental pyelography* is preferable to intravenous pyelography in the diagnosis of early cases of tuberculous kidney. The injection should be made (as Legueu has insisted upon) under screen examination, and the substance used must be non-irritating—viz., 30 per cent **Uroselectan**. Diagnostically important is the failure of one calix or group of calices to fill with the media. Of 162 cases of renal tuberculosis examined by simple X rays (that is, without pyelography), 52 were positive, and in 29 of these the plain X-ray was definitely of more value than other methods of examination. In 9 cases, however, the X-ray appearances were more in keeping with those of lithiasis (G. Söderlund³⁸).

Wildbolz, quoted by A. Linkberg,³⁹ has followed up over 300 cases of renal tuberculosis treated medically. Only 6 per cent lived for ten years. Linkberg finds that of 42 cases he had operated upon during the past ten years, 78 per

cent were quite well, 17 per cent still had frequency, 6 per cent were still ill, 11 per cent died. In 155 nephrectomized cases of renal tuberculosis followed up at the Lund Surgical Institute, 101 are alive and well (Ivarsson⁴⁰).

If renal tuberculosis declares itself during pregnancy, the offending organ should still be removed, except during the last month.

Thomas and Kinsella, quoted by Taub,⁴¹ who have had considerable experience in renal tuberculosis at Glen Lake Sanatorium, say, "we have never removed a kidney which eliminated tubercle bacilli that did not contain a lesion of tuberculosis. In some instances serial sections have been necessary before the lesion of tuberculosis could be found."

Hæmaturia occurring soon after nephrectomy for tuberculosis is a well-known occurrence, and it is sometimes puzzling to explain where the blood is coming from (E. Papin and P. Bordas⁴²).

Renal Tumours.—

Hæmangioma of the Kidney.—Among the rarest tumours of the kidney are hæmangioma. Angioma of the kidney show all grades of capillary dilatation until networks of intercommunicating vascular spaces are formed. These tumours are entirely benign and they tend to increase gradually in size. If they invade the epithelial lining of the kidney, hæmaturia results from rupture of one of the vessels. These hæmangioma may be difficult to demonstrate. Essential hæmaturia is a condition against which every inquiring surgical mind must rebel. There probably is an underlying understandable cause for every bleeding kidney, and sometimes this will be found to be a small hæmangioma. (I. McKenzie and A. Hawthorne,⁴³ H. Bailey.⁴⁴)

Wilm's Tumour (Embryonal Adenosarcoma of the Kidney).—A. L. Dean and G. T. Pack⁴⁵ have studied sixteen cases of Wilm's tumour. The average age of the patient was 3 years. The earliest sign is usually the accidental finding of a lump in the abdomen. When a large mass is palpable the prognosis is bad. In earlier cases the differential diagnosis is not easy. Polycystic kidney, ovarian tumour, and splenomegaly are among the many conditions which have to be excluded. Surgical treatment alone is unsatisfactory, recurrence being the rule. The following course is advised: **X-ray Treatment** until the growth has largely or wholly disappeared, then **Nephrectomy**, after which radiation is continued.

Grawitz Tumour.—G. Barkow⁴⁶ deals with the early diagnosis of Grawitz tumour of the kidney. It is of paramount importance to make the diagnosis as soon as possible, for in its early stages the tumour is practically benign. Usually a palpable tumour is the only sign. Later hæmaturia occurs. *Occasionally fever is the only symptom.* E. Ljunggren⁴⁷ points out that it was Israel in 1911 who first called attention to this curious obscure pyrexia. He details the case of a widow, aged 52, who was examined by several doctors and various specialists for a persistent evening rise in temperature. Eventually a retrograde pyelogram displayed a distortion of the upper calices of the left kidney. The kidney was explored and nephrectomy performed. There was a typical Grawitz tumour situated in the upper pole.

S. Scandurra⁴⁸ removed a Grawitz tumour. Four years later the patient again noticed hæmaturia. At operation it was discovered that a *recurrence had occurred in the proximal end of the ureter on the same side.*

For excision of an enormous kidney tumour V. Pauchet⁴⁹ employs a transverse abdominal incision and ligates the pedicle before attempting to deliver the tumour.

Renal Injuries (see also KIDNEY, RUPTURED).—

Spontaneous Rupture of the Kidney.—A fat lady, aged 49, whilst seated at the dinner-table experienced symptoms which later were shown to be due to a

rupture of the left kidney. At operation the kidney and suprarenal gland, together with the perinephric fat, were removed *en bloc*. There was a large subcortical hematoma and a rent in the parenchyma. There was no previous history of injury and no evidence of pre-existing kidney disease (R. Hullsick⁶⁰).

A. Adler-Racz⁵¹ reports two cases of *rupture of the kidney with extensive perirenal hæmatoma*. Both cases illustrate the difficulties which are often experienced in such cases in attempting to isolate and ligate the renal vessels when the pedicle has been surrounded with blood-clot for some days.

Desjaques and his associates⁵² have collected 46 cases of *rupture of the kidney associated with ruptured spleen*. Most of the cases were males under the age of 20. The operative mortality of combined nephrectomy and splenectomy was about 50 per cent.

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LABOUR AND ITS COMPLICATIONS. (See also OBSTETRICS AND RADIOLOGY.)

Beckwith Whitehouse, M.S., F.C.O.G.

The Relief of Pain during Labour.—The last year has witnessed renewed attempts on the part both of anaesthetists and obstetricians to accomplish the relief of distress during labour by methods which at the same time are both efficient and safe to mother and child. Whilst the problem is not difficult in so far as institutional practice is concerned, midwifery in the patient's own home introduces factors which materially complicate the situation where the individual needs of the patient, the obstetrician, and the midwife all have to be considered. In a discussion at the London Association of the Medical Women's Federation, E. Pye¹ called attention to the fact that 60 per cent of the births in Great Britain are attended by midwives. The scantiness of their training in the use of drugs, the discouraging attitude of local authorities, and the patient's belief that nothing can be done to relieve the pain has led midwives to an attitude of acquiescence. Midwives are not debarred by their rules from using either chloral, bromide, or even opium, and the crushable **Capsules of Chloroform** now being investigated at Queen Charlotte's and the Middlesex Hospitals appear likely in the near future to provide another means of relieving pain which may safely be entrusted to them.

Of *inhalation anæsthetics* a mixture of **Nitrous Oxide and Oxygen** appears to be the method of choice when available. It can be used from the beginning of the first stage to the end of the third without harm to mother or child. It does not interfere with the normal mechanism, it shortens the second stage, and causes no shock or hæmorrhage. At the Royal Free Hospital E. Browne³ observes that the general plan is to give sedatives either by the mouth or intramuscularly during the first stage, and gas and oxygen during the second, with chloroform or ether for the 'crowning' of the head. At the same time, for the practitioner working single-handed, this writer considers that chloroform is still the ideal anæsthetic if required for the second stage or the actual delivery of the head only. Whilst for institutional work gas and oxygen undoubtedly possess advantages, certain disadvantages noted by J. King and J. Morgan² will undoubtedly preclude its general adoption in the home. First and foremost is the question of expense. Special apparatus is required, and the average cost per patient is at least 2s. as opposed to 3d. ! Further, the services of an anæsthetist are naturally required throughout the second stage, a luxury that under the exigencies of practice is by no means always available. Finally, in order to avoid unpleasant and possibly fatal complications during administration, an adequate supply of oxygen must always be available.

Amongst *analgesics* as distinguished from pure inhalation anæsthetics interest continues to centre in the derivatives of barbituric acid. In Germany **Pernocton**, a 10 per cent solution of the sodium salt of secondary butyl- β -bromallyl barbituric acid has been studied extensively by H. Brammer,⁴ who has completed 1500 deliveries using this sedative alone. Pernocton may be administered either intravenously or intramuscularly or by both routes in combination. Using 5 c.c. of the drug Brammer found that the intravenous route was many times more efficacious than the intramuscular method, and considers that the latter has a variable rate of absorption. In the case of primiparæ he advises that pernocton should be given when the os is 'five shillings' dilated, and in multiparæ when a 'three shillings' dilatation is effected. The average duration of the 'twilight sleep' for a single dose in the writer's series of 72 cases was found to be 2.53 hours. In 28 per cent it was 1.45 hours. In 80 per cent the anæsthesia lasted for three hours and the amnesia was complete. One case was refractory, but no death was recorded. Eighteen of the infants showed some degree of respiratory distress.

For the purpose of giving a second injection where labour is at all prolonged, the relationship of the second to the first injection must receive careful consideration. Brammer recommends the following :—

FIRST DOSE		SECOND DOSE	
<i>Intravenously</i>	<i>Intramuscularly.</i>	<i>Intravenously</i>	<i>Intramuscularly</i>
4.0 c.c.	2.0 c.c.	2.0 c.c.	2.0 c.c.
3.5 c.c.	1.5 c.c.	1.5 c.c.	1.5 c.c.
3.0 c.c.	1.0 c.c.	1.0 c.c.	1.0 c.c.

The value of pernocton in midwifery practice has also been investigated by R. F. Matters,⁵ of Adelaide, and his results correspond very closely with those published in Europe. He finds that the intravenous route is the more exact method of injection, and stresses the importance of quiet surroundings and careful suggestion as essential to the technique. The injection must be given slowly in order that the concentration of the drug in the blood be not suddenly raised.

So far as Great Britain and America are concerned another barbituric acid derivative, **Nembutal**, or sodium-ethyl-methyl-butyl barbiturate, appears to have been more extensively used. An interesting paper by J. V. O'Sullivan

and W. W. Craner⁶ records a series of observations at the London Hospital on 60 consecutive cases where a state of 'twilight sleep' was induced by means of a combination of **Nembutal and Chloral Hydrate**. The series was entirely unselected, and contained cases of test labour and pregnancy complicated by heart disease and albuminuria. The drugs were given by mouth only—an obvious advantage—and a total dose of $7\frac{1}{2}$ gr. of nembutal and 120 gr. of chloral hydrate was not exceeded in twelve hours. This total was reached as follows: an initial dose of 3 gr. of nembutal and 30 gr. of chloral hydrate; subsequent doses of $1\frac{1}{2}$ gr. of nembutal and 30 gr. of chloral hydrate. The first 'repeat' dose was given two hours after the initial dose, and subsequent doses every three hours. The nembutal preceded the chloral by ten minutes in order to avoid the possibility of vomiting. The chloral may conveniently be administered in 3 oz. of freshly prepared lemonade sweetened with three or four teaspoonfuls of sugar. The interval between successive doses should never exceed four hours, as when this period is exceeded amnesia is never complete.

The results obtained by the writers in their series of 60 cases are given as follows:—

Painless labour	..	37 cases	..	..	(62 per cent)
Very good result	..	13 cases	..	..	(21 per cent)
Good result	..	6 cases	..	..	(10 per cent)
Failure	..	4 cases	..	..	(7 per cent)

The babies in all but six cases were born with a good colour and there was no foetal mortality. Forceps delivery was necessary in 16.6 per cent of cases as against a normal forceps rate at the London Hospital of 13.4 per cent during the past two years. A general anæsthetic of either gas and oxygen or ether was given when forceps delivery was indicated. It is also interesting to note that in 20 cases chloroform, given by Junker's inhaler, was administered for 'crowning' of the head. O'Sullivan and Craner conclude that the combination of nembutal and chloral is safe and can be given to any woman in labour. They also consider that the drugs may safely be entrusted to midwives so long as they follow the technique carefully and never vary it without the direct permission of a medical practitioner.

Induction of Premature Labour.—The mechanical induction of labour by the introduction of a foreign body, whether it be bougies or rubber tube, between the uterine wall and the bag of membranes, and which is left *in situ* until uterine contractions commence, is a method which is obviously open to criticism. The main objection, of course, is the possibility that uterine infection may occur. To overcome these objections H. J. Drew Smythe⁷ has recently introduced a modification of the old method of rupture of the membranes. The essential point in Smythe's operation is that the bag of membranes is punctured above the presenting part, i.e., the child's head, with the result that the amount of liquor amnii removed can be directly controlled, and sufficient is left to assist in the normal dilatation of the cervix. To effect this the author employs a double-curved silver catheter similar to a prostatic catheter, containing a blunt-ended stylet. After thorough antiseptic cleansing of the vagina and cervix a Sim's speculum is introduced and the cervix seized with vulsellum forceps. The cervical canal is *not* dilated and the catheter with the stylet withdrawn is passed up to and round the child's head between the uterine wall and the membranes. The stylet is then pushed home and the proximal end of the catheter depressed. This manœuvre punctures the membranes, and from half to one pint of liquor amnii is withdrawn into a measured vessel. When the catheter is withdrawn there should be no further escape of liquor. Labour usually commences in twenty-four hours, but may be delayed

for a few days, as in the case of other methods of mechanical induction. Smythe has not had a single instance of infection of the amniotic cavity following this operation and confidently recommends it for all cases in which the fœtus presents by the vertex. [Our own experience of the method is such as to confirm the author's contentions.—B. W.]

Quinine and Fœtal Death.—The medicinal induction of premature labour by quinine alone or by a combination of quinine and posterior pituitary extract has during recent years enjoyed considerable popularity. From time to time, however, isolated notes and observations appear in the medical press that give colour to the impression that the employment of quinine is not unattended with an element of risk to the child. H. Williamson,⁸ in 1922, was apparently the first writer to call attention to the tetanic uterine contractions which sometimes follow the administration of this drug and which jeopardize the child. G. Gellhorn⁹ also does not believe that the quinine-castor-oil method of induction is entirely harmless. In a case recorded by him the usual dosage was followed by intra-uterine death of the fœtus. No other cause of death could be discovered and the child appeared to die promptly after the quinine was given. On the other hand, E. S. Sadler, W. J. Dilling, and A. A. Gemmell,¹⁰ in 1930, stated that although there is experimental evidence to prove that quinine may cause intra-uterine death of the child, statistics show that this risk is not greater than that of still-births from undiscovered causes in otherwise normal cases.

That the question is by no means settled is proved by a recent communication of B. D. Knoblauch,¹¹ who records three fœtal deaths in connection with patients where quinine induction was repeated a second time. Forty-eight hours elapsed between the last dose of the first induction and the first dose of the second attempt. In all three cases, according to the writer, the labours were perfectly normal, the first stages lasting 8 hours, 3½ hours, and 5½ hours, and the second stages 25 minutes, 48 minutes, and 56 minutes respectively. In the first two cases the fœtal heart-sounds ceased during the first stage, and in the third case the fœtal heart stopped in the second stage. Knoblauch applied low forceps in this case and an easy delivery of a still-born child was effected. All three patients were just about at term. The writer concludes that quinine must have a marked detrimental effect on the fœtus when it is remembered that in the majority of cases so induced the liquor amnii is meconium-stained, even though the labours were not difficult enough to account for this on the basis of fœtal distress caused by disproportion.

[During the past year three other instances of fœtal death associated with and apparently the direct result of quinine induction have been brought to our personal knowledge by practitioners, and in view of the widespread employment of the method both in and out of hospital it seems desirable to call attention to the possible risk entailed. Pending a general inquiry on the matter there can be little doubt that all cases of this nature should be carefully investigated and recorded.—B. W.]

Contracted Pelvis.—The relative value of the induction of **Premature Labour**, **'Test' Labour**, and **Cæsarean Section** in the treatment of minor degrees of contracted pelvis is considered in the report upon a discussion at the Royal Society of Medicine,¹² based upon figures supplied by seven teaching hospitals. The report is illuminating as demonstrating the different practice and policy of various institutions in dealing with what is generally recognized as a difficult problem.

Alan Brews and V. J. F. Lack observe that induction of labour has ceased to be practised at the London Hospital since the late Whitridge Williams stated that he had given up the procedure and put forward good reasons for

its abandonment. Trial labour at 'term' is carried out in all cases of slight or moderate disproportion. When marked disproportion exists, Cæsarean section at 'term' is performed. In a total of 45 cases where the diagonal conjugate varied from $3\frac{1}{2}$ to $4\frac{1}{2}$ in. the percentage of deliveries requiring Cæsarean section was 28.08. The maternal mortality in the whole series was nil, and the foetal or neonatal mortality 8.8 per cent. A. Brews regards 'test' labour as being a safe method when carried out in suitable surroundings. Its educational value is enormous, and Nature frequently successfully overcomes an astonishing amount of disproportion. On the other hand, uterine inertia and early rupture of the membranes are sometimes troublesome, and occipito-posterior presentations are less likely to undergo spontaneous forward rotation.

G. F. Gibberd notes that at Guy's Hospital use is made both of induction of premature labour and of trial labour, and is of opinion that better results are obtainable by the use of both methods than by either exclusively. Pre-ordained Cæsarean section has no place in the management of moderate degrees of pelvic contraction. In a series of 5045 total deliveries at Guy's Hospital the percentage of Cæsarean sections was 0.83. The maternal mortality for all cases of contracted pelvis was 0.53 per cent and the infant mortality 9.1 per cent.

J. W. A. Hunter expresses the opinion, based upon the records of 860 cases of minor degrees of pelvic contraction (diagonal conjugate 4 to $4\frac{1}{2}$ in.), all antenatal cases from which emergencies are excluded, that induction of premature labour is a valuable form of treatment. In his view the relatively high maternal mortality and high foetal mortality in cases of trial labour form serious limitations to its sphere of usefulness. Further, the relatively high maternal mortality in Cæsarean section (3.25 per cent in the Manchester figures) is out of proportion to the lowered foetal mortality. The maternal mortality in Hunter's series of 563 inductions was 0.53 per cent. The still-births and neonatal deaths in the same series was 9.7 per cent in primiparae and 5 per cent in multiparae.

That induction of premature labour is by no means unattended by an element of risk is emphasized by A. Morris Jones. Following induction at Queen Charlotte's Hospital 9.5 per cent of cases developed puerperal morbidity: 20.7 per cent of these morbid cases followed instrumental delivery after induction. The maternal mortality in the case of 110 induction and forceps operations at Queen Charlotte's Hospital was 5.5 per cent, as against a figure of 0.14 per cent in the case of 704 simple inductions only. The maternal mortality attached to 144 Cæsarean sections at the same institution was 1.3 per cent.

J. S. Fairbairn, in the same discussion, said that the induction of premature labour was as much overdone to-day as the Cæsarean operation, but the consequences were far less serious. Whereas nothing was learnt from a Cæsarean section, much might be learnt of the capacity of the natural powers from a carefully observed induced labour. Nature usually did much better than it had been given credit for. For this reason Fairbairn is of opinion that induction would be most practised "by the inexperienced in their callow years, and lessen as they learned"! Trial labour demands both experienced obstetricians and the resources of a hospital, and is thus unsuited to the conditions of family practice. The elimination of induced labour from the medical school has therefore its disadvantages. To discard induction altogether would only add to the number of Cæsarean sections, already too many, as all agreed.

W. H. F. Oxley is also of the opinion that interference is far too frequent in slight degrees of pelvic contraction, and that the larger experience one had the less one interfered. He had found interference necessary in only 1 per cent of all booked cases, and even that small percentage had tended to become lower in the past few years. He called attention to the fact that from the

figures available the death-rate from trial labour and Cæsarean section was 3.5 per cent, while from induction only one case in 600 was fatal. He thought that there was no need to go further in deciding which was the best treatment.

REFERENCES.—¹*Brit. Med. Jour.* 1932, i, 660; ²*Ibid.*; ³*Lancet*, 1931, ii, 346; ⁴*Schmerz, Narkose u. Anæsthesie*, 1931, ii, 399; ⁵*Med. Jour. of Australia*, 1931, Nov. 21, 660; ⁶*Lancet*, 1932, i, 119; ⁷*Brit. Med. Jour.* 1931, i, 1018; ⁸*Surg. Gynecol. and Obst.* 1922, June; ⁹*Amer. Jour. Obst. and Gynecol.* 1927, June; ¹⁰*Jour. Obst. and Gynecol. Brit. Emp.* 1930, xxxvii, 529; ¹¹*Jour. Med. Assoc. South Africa (B.M.A.)* 1931, Dec. 12, 785; ¹²*Proc. Roy. Soc. Med.* 1931, Sept., 1521.

LARYNX, DISEASES OF. (See also AIR-PASSAGES, UPPER, AND POST-CRICOID REGION, MALIGNANT DISEASE OF.)

F. W. Watkyn-Thomas, F.R.C.S.

Stenosis of the Larynx.—StClair Thomson¹ says of stenosis of the larynx that while most cases of stenosis are the result of a badly performed tracheotomy, the first step to correct a stricture is often a repetition of a correctly executed opening in the trachea. The causes of unsatisfactory results after tracheotomy he summarizes thus: (1) The reluctance with which the operation is undertaken, which leads to delay until the operation is difficult and sometimes useless; (2) Imperfect performance of the operation; (3) 'Unreasonable and unwarrantable haste' in depriving the patient of his tracheotomy cannula.

He advises **Permanent Tracheostomy** as the correct treatment for many cases of laryngeal stenosis, and deals with the objections raised to this method:—

1. *The abolition of nasal respiration.* The value of nasal respiration is of greatest importance in infancy and childhood; in later life its importance is far less.

2. *Social disability.* The orifice is easily concealed, and with a speaking-valve attachment the voice is easily produced and may be quite normal. "I know of no serious social disadvantage entailed by a tracheotomy except that a patient cannot swim."

3. *The liability to bronchitis.* The dread of bronchitis is a fetish.

4. *The liability to catarrh.* Catarrh, when it does occur, is due, not to the irritation produced by cold air, but to the irritation of a badly planned tracheotomy. The most usual mistake is to divide the first ring of the trachea or even the cricoid cartilage. Thus the cannula is introduced into the narrow, vascular, glandular, and sensitive subglottic larynx instead of into the roomy trachea.

(In support of these statements nine patients were shown at the meeting who all had strong, and some quite normal, voices, and who all corroborated the statements made as to the trifling nature of their disability. These patients had all worn tubes for long periods—from eleven months to twenty-one years.)

In the discussion which followed the reading of this paper Herbert Tilley and Ritchie Rodger referred to cases illustrating the advantages of permanent tracheostomy. Howarth, speaking particularly of bilateral abductor paralysis, remarked on the difficulty of giving permanent relief in cases of laryngeal stenosis by surgery. In two cases he had twice performed Jackson's operation of ventriculo-cordectomy without success, because each time the new cicatricial cord which formed caused a new stenosis in a few months. The same difficulty in obtaining permanent relief was found after the operations of Wittmaack (downward displacement of one cord) and Réthe (outward displacement of arytenoid). Portmann, said that in some cases of cicatricial stenosis he had removed the cicatricial tissue, dilated the larynx with a tube, and, after a year or two, done a plastic operation with a rib-cartilage graft.

[The general opinion seemed to be that: (1) The commonest cause of cicatricial stenosis following tracheotomy was due to damage to the cricoid (E. E. D. Davis suggested that this was caused by over-extension of the head); (2) If this occurred a lower tracheotomy should be done as soon after the operation as possible; (3) Permanent tracheostomy appeared the least objectionable treatment of double abductor paralysis.—F. W. W.-T.]

W. B. Hoover,² writing on bilateral abductor paralysis, says that tracheotomy is essential, and agrees that many authorities hold that nothing further should be done. In selected cases he believes that operation on the larynx gives permanent relief. Like Howarth he has failures with cordectomy and with Réthe's operation, and prefers an operation which he describes as 'submucous resection' of the cords. This is done by laryngo-fissure after preliminary tracheotomy. The mass of tissue between the cord and the thyroid cartilage is then dissected out under the laryngeal mucosa, which is preserved intact.

Functional Aphonia.—F. D. Marsh,³ reviewing a series of 16 cases, comments on the frequency with which functional aphonia is associated with sepsis of the mouth or upper airways. Of these 16 cases there were only 2 in which no septic focus could be found. In the other 14 there were 6 cases with antral suppuration, 4 with septic tonsils, and 4 with dental sepsis. On these grounds he suggests that 'functional' aphonia should be classified as 'primary' or hysterical, and 'secondary' where it follows a laryngitis due to infection from a septic focus.

Innocent Tumours of the Larynx.—

J. Terracol⁴ describes cases of both kinds of *laryngeal cysts*: (1) True laryngeal cysts, which in the cases quoted appear to have been retention cysts of the ary-epiglottidean fold and of the ventricular band; and (2) Cervico-laryngeal, derived from remains of a branchial cyst. In one of these cases a portion of the cyst was malignant.

F. E. Simpson⁵ describes two cases of *hæmangioma of the larynx*. Both patients had a life-long history of hoarseness and coughing. One patient had had several hæmorrhages. In this case a smooth dark blue mass extended from the larynx to 3 cm. above the epiglottis. In the other case a 'mound' of irregular dark-blue vessels spread back from the base of the right tonsil to the pyriform sinuses and into the larynx without touching the true cords. Both cases were treated successfully with **Radon**.

A case of *lipoma of the larynx* is described by O. J. Dixon and F. C. Helwig.⁶ The patient suffered from noisy and difficult breathing. There was a smooth, pale, rounded swelling protruding above the left cord from the ary-epiglottidean fold. Laryngo-fissure was done and it was then found that the growth had spread so far that laryngectomy seemed necessary. Fortunately histological examination showed that the tumour was made up of fatty tissue. Even then a second laryngo-fissure had to be done in three months' time, when the tumour was completely and satisfactorily removed.

F. A. Figi⁷ describes 6 cases of *chondroma of the larynx*. The usual symptoms are dyspnoea and hoarseness. The appearance on examination is a smooth sessile mass covered with normal mucosa in which the blood-vessels are prominent. This may be associated with displacement or immobility of the cord on the same side. Positive X-ray evidence is valuable, but to get a useful photograph the exposure must be very short. Radium treatment seems useless, but if the tumour with its capsule is clearly dissected out there should be no recurrence.

Laryngeal Obstruction.—A rare cause of laryngeal obstruction has been reported by Dundas-Grant,⁸ where, in a case of lymphatic leukæmia, a

patient had weakness of the voice and regurgitation of fluids. At the first examination there was irregular thickening of both cords and 'very incomplete adduction'. Later the cords became more forced together, with poor abduction and stridor. The patient died four months after the first examination. When the larynx was dissected, under each swollen cord was a fissure running back to the vocal process and then upwards, and each fissure was filled with dense yellow cheesy material. At first sight the appearance of the cords had suggested tuberculosis, but no tubercle bacilli were found.

REFERENCES. ¹*Proc. Roy. Soc. Med.* 1931, 1588; ²*Arch. Oto-Laryngol.* 1932, xv, 339; ³*Lancet*, 1932, ii, 289; ⁴*Ann. d'Oto-Laryngol.* 1931, Nov., 1141; ⁵*Jour. Amer. Med. Assoc.* 1931, Jan. 31, 342; ⁶*Arch. Oto-Laryngol.* 1931, Sept., 284; ⁷*Ann. Oto-Rhino-Laryngol.* 1932, xli, June, 369; ⁸*Jour. Laryngol.* 1931, xlv, 848.

LEATHER-BOTTLE STOMACH.

Robert Hutchison, M.D., F.R.C.P.

This subject was last reviewed in the ANNUAL of 1926 (p. 296) under the name of 'linitis plastica'. J. Friedenwald and Theodore H. Morrison¹ have published the account of seven cases with a review of previous literature. They hold that the term 'leather-bottle stomach', as suggested by Wyard, should be used as a general term to cover a number of conditions which it is not possible to differentiate clinically but which differ pathologically. Broadly speaking the condition is either carcinomatous or fibrous, and may be either local or diffuse. They suggest that the term 'carcinoma plastica' should be substituted for linitis plastica as covering the cases due to a small-celled epithelioid growth of definite pathological characteristics. This must be distinguished from the cases due to scirrhus carcinoma.

The cause of the fibrous form is unknown, but such conditions as syphilis and chronic gastritis have been considered as playing a part in the etiology. On the questions of diagnosis and treatment the paper adds nothing to what was stated in the earlier review in this ANNUAL.

REFERENCE. ¹*Amer. Jour. Med. Sci.* 1931, Dec., 847.

LEISHMANIASIS. (See KALA-AZAR.)

LEPROSY.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY AND PROPHYLAXIS.—In a further paper on leprosy in India, E. Muir,¹ judging from numerous surveys, estimates the total lepers in India at half to one million, mostly slight uninfected cases and occurring among the lower classes and castes under conditions of overcrowding and promiscuous social and sexual habits. J. Lowe² deals with the leprosy problem in India in the light of eight years' experience, about 5000 cases seen, and 3000 treated in a leper institution. He deprecates the unwarranted pessimism of some British writers and the over-optimism of some lay writers abroad. The disease is contagious, but not highly infectious. He finds that treatment renders the nasal mucous membrane negative as regards bacteria earlier than the skin, with resulting greatly decreased infectivity of the patients. Almost every case ceases to progress, with loss of infectivity and all activity in some, while in the more advanced ones the lesions decrease and infectivity is reduced, although some lepra bacilli remain in the skin. In India segregation is impossible; but the present system of survey and treatment is valuable, although out-patient clinic treatment is handicapped by irregular attendance of some cases. Much patient work will therefore be required to reduce leprosy materially in India.

PATHOLOGY AND BACTERIOLOGY.—Experimental inoculation with emulsions of leprous nodules of monkeys has been studied by E. B. McKinley and M. H. Soule,³ and they confirmed the work of Reenstierna by producing limited nodular

lesions in eighteen to twenty days at the sites of infection, which heal spontaneously and disappear in a few weeks. They obtained similar results by the inoculation of cultures of the lepra bacillus. J. M. Henderson⁴ describes and illustrates the formation of nodules in the skin around lepra bacillus emboli in the deeper layers. Resolution takes place through invasion of the nodule by polynuclear leucocytes with liquefaction and later the formation of fibrous tissue and breaking up and disappearance of the lepra bacilli. The same worker⁵ has studied an acid-fast bacillus grown by E. Muir from a leprous nodule by Shiga's method, but he came to no conclusion regarding its relationship to leprosy. J. Lowe⁶ concludes from the examination of 160 cases of leprosy for the bacillus that the skin showed the organism much more frequently than the nose, and the nose was not affected unless the skin was. Examination of clips from the lobe of the ear gave most positive results even if not obviously affected, and only four cases were positive elsewhere and not in the lobe of the ear. E. Muir and S. N. Chatterji⁷ have demonstrated lepra bacilli in the stratified epithelium of the skin and occasionally in superficial scrapings with a knife, so it appears to be possible for them to escape from unbroken skin. R. W. Cilento and E. A. North⁸ have studied rat leprosy in tropical Australia, but found no clear evidence of any relation to human leprosy. R. G. Raghunatha⁹ has found a reduction in the serum albumin and an increase in the serum globulin in the blood of lepers, and the latter is increased by hydnocarpus oil treatment.

TREATMENT.—The intradermal injection of **Hydnocarpus Preparations** continues to gain ground. E. Muir¹⁰ prefers for this purpose **Ethyl Esters** with 4 per cent **Creosote**, as it is less quickly absorbed than sodium hydnocarpate and is less irritating. On the other hand, A. D. Bhandari¹¹ finds **Alepol** (sodium hydnocarpate) less irritating for intramuscular and subcutaneous injection than E.C.O. and other preparations of hydnocarpus oil, and it is comparatively cheaper. B. B. Dikshit¹² came to the same conclusion, and he thinks that alepol intramuscularly and intravenously compares favourably with hydnocarpus oil treatment. The last-named worker¹³ also reports work on the pharmacology of alepol; and he advises dissolving the drug in Locke's solution and adding a small quantity of serum to lessen its hæmolytic action on intravenous use. Alepol inhibits the growth of the tubercle bacillus in a dilution of 1-200,000.

REFERENCES.—¹*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, Nov. 30, 173; ²*Ind. Med. Gaz.* 1932, April, 208; ³*Amer. Jour. Trop. Med.* 1932, Jan., 1; ⁴*Ind. Med. Gaz.* 1931, Sept., 483; ⁵*Ind. Jour. Med. Research*, 1931, July, 145; ⁶*Ibid.* 1932, Jan., 867; ⁷*Ibid.* April, 1163; ⁸*Med. Jour. Australia*, 1931, Dec. 19, 767; ⁹*Ind. Jour. Med. Research*, 1932, April, 993; ¹⁰*Ind. Med. Gaz.* 1932, March, 121; ¹¹*Ibid.* May, 244; ¹²*Ibid.* Jan., 7; ¹³*Ind. Jour. Med. Research*, 1932, Jan., 775.

LEUKÆMIA.

Stanley Davidson, M.D., F.R.C.P.E.

MYELOID LEUKÆMIA.

TREATMENT.—The value of **Irradiation** and its effect on the duration of life are discussed by W. J. Hoffman and L. F. Craver¹: 82 cases of myelogenous leukæmia were analysed and compared with a series of 130 cases reported by Minot, Buckman, and Isaacs. The decade of greatest incidence is between the ages of 35 and 45; 68 of the cases were males and 32 females. The average duration of life after the onset of the disease was 3.36 years, varying in individual cases from 6 months to 16 years. This figure is 4 months longer than in Minot's group. The average duration of life after the discovery of splenomegaly was 2.6 years. Irradiation had no effect on the duration of life, and there was no difference between one group which had irradiation to the spleen and the long

bones, and the other group which had it to the spleen alone. The average duration of efficient life was 30 per cent greater in the irradiated patients than in the non-irradiated. The reviewer, from his own experience, agrees with these findings, and believes that the increased efficiency which results from irradiation fully justifies its employment, although the total duration of life may not be prolonged.

A. Piney and J. S. Riach,² in a most excellent paper, give a complete review of all possible methods available for the treatment of chronic myeloid leukæmia. They recommend that simple medical measures should be used first, before radio-active means are employed. **Arsenic** appears to be of definite value in certain cases, for not only may there be a fall in the white count, but there is an improvement in the clinical condition and a rise in the red-cell and hæmoglobin levels.

C. E. Forkner and T. F. McN. Scott³ also report beneficial effects from arsenic therapy in 9 cases of chronic myelogenous leukæmia. The authors believe that the best results were obtained by the rather rapid and relentless administration of Fowler's solution until the desired effect is produced, or until signs of beginning intoxication occur. The solution should then be discontinued for approximately one week, and resumed in smaller doses. In the cases reported by these authors the total number of white blood-cells was reduced from hundreds of thousands to approximately normal, and the immature cells showed a marked decrease, both absolutely and relatively, and in some cases disappeared from the blood, while the red-blood-cell picture coincidentally improved. Simultaneously with the fall in the leucocytes there occurred a relative increase in the number of monocytes and of basophil granulocytes.

While the reviewer agrees that there is sufficient evidence to justify the trial of arsenic for a period in cases which have not gone on too long, it must be recognized that it fails to produce any beneficial results whatsoever in regard to the white-cell picture in many cases of leukæmia which subsequently respond excellently to irradiation. It is usually wiser to combine arsenic therapy and irradiation at the same time. Ordway and Gorham believe that the chief value of arsenic lies in the treatment of the anemia so frequently associated with chronic leukæmia, and in the beneficial effects produced on the patient's general health and sense of well-being. Similarly **Iron** should be employed when required. **Benzol**, as recommended originally by Koranyi, of Budapest, may be given in capsules coated with salol containing $\frac{1}{2}$ grm. of benzol, with equal parts of pure olive oil. Two capsules are given as a test dose, thereafter increasing gradually up to ten capsules daily. Cases have been reported in which the white-cell-count has been markedly reduced by this method. Benzol appears to act by direct destruction of the white cells in the bone-marrow. It is a highly toxic and dangerous drug, which may easily produce aplastic anemia. The reviewer therefore believes that it is safer to trust to irradiation and arsenic, and only to use benzol in cases which fail to respond to irradiation, since Nægeli claims that it may occasionally be effective in such cases.

In the section devoted to irradiation Piney gives a most excellent review of the literature, and deals very fully with the problem whether the spleen alone should be irradiated or whether the skeleton should be included. From his own experience he believes that better results are produced by first irradiating the skeleton. A study of the literature, however, reveals that the majority of workers have a different experience to this. It would be difficult to compare Piney's cases with those of workers who irradiate the spleen alone, since in his series the spleen had also been irradiated. The reviewer has several cases

under his charge at present who have had the spleen alone irradiated, and whose blood charts are equally as good as the best quoted in Piney and Riach's paper. The mechanism by which irradiation reduces the white count is still quite unknown. The older view was that the rays caused a direct destruction of the white cells, but more recent studies, particularly by Isaacs, suggest that all Roentgen-ray irradiation may be considered as stimulative, and on this basis he believes that the cells grow older rapidly and hence die quicker. In short, the fall in the number of leucocytes in the circulating blood is due to increased speed of maturation. With regard to dosage, the reviewer believes that it is better to give small doses repeated at short intervals, than to give large doses, since the latter may cause damage to the reticulo-endothelial system in the spleen.

LYMPHATIC LEUKÆMIA.

TREATMENT.—It was hoped at one time that just as liver extract was effective in the treatment of pernicious anæmia, **Spleen Extract** might be of value in the treatment of the leukæmias. J. E. Gouce et al.,⁴ from information derived from the treatment of a small series of cases with spleen extract, conclude that this method is without therapeutic effect in the cases of lymphatic leukæmia studied by them.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1931, Sept. 19, 836; ²*Brit. Jour. Radiol.* 1932, May, 323; ³*Jour. Amer. Med. Assoc.* 1931, July 4, 3; ⁴*Amer. Jour. Med. Sci.* 1932, June, 850.

LINDAU'S DISEASE.

Macdonald Critchley, M.D., F.R.C.P.

In the **MEDICAL ANNUAL**, 1931 (p. 280) a full account was given of the condition known as Lindau's disease, wherein a hæmangiomatic cyst of the cerebellum is associated with angiomas of the retina. The main clinical and pathological features may be summarized thus: (1) A cyst lying in the lateral lobe of the cerebellum—it is often regarded as a 'simple' cyst, as the presence of a small nodule of vascular tissue lying on the anterior wall may elude cursory observation; (2) Vascular tumours of the retina, which may precede by very many years the onset of cerebellar symptoms; (3) The presence of tumours in the viscera, such as neoplasms of polycystic or angiomatic type in the pancreas, liver, kidneys, and epididymis; (4) A familial incidence is at times demonstrable; (5) Severe injury to the head seems in some cases at least to have been a precipitating factor in the development of symptoms.

HISTORY.—The disease is usually associated with the name of Lindau, who in 1926 classified on a pathological basis a large number of cerebellar cysts. Having isolated an angiomatic variety he found that it was often associated with the hæmangiomatic retina previously described by Treacher Collins and Van Hippel. It is interesting to note, however, that Hughlings Jackson¹ in 1872 had noted in the wall of a cerebellar cyst a tumour which extended to the surface of the cerebellum. Probably the first adequate description of the disease, with its coexistence with visceral masses, was made in 1885 by P. M. Pye-Smith.² This physician demonstrated before the Pathological Society of London specimens from a policeman of 27 who had died from an intracranial neoplasm. "The cerebellum . . . contained in the left lobe a cyst nearly as large as a billiard ball" . . . "the present case is the more remarkable because, associated with this cerebellar cyst we found several small serous cysts in the otherwise healthy kidneys, and also a number of cysts in the pancreas, a condition which, so far as I know, is unique." Pye-Smith then went on to describe the more detailed appearances of these latter.

Angiomatous Tumours in the Cerebrum.—Although Cushing was doubtful as to the occurrence of intracranial angiomatous masses outside of the cerebellum, a contrary opinion was given in the *MEDICAL ANNUAL*, 1931 (p. 282). Within the past twelve months, two published examples have been recorded. In the former, reported by G. F. Rochat,³ an angioma—associated with Lindau's disease—was present in the cerebrum; in the example recorded by W. G. Barnard and F. M. R. Walshe⁴ a similar tumour was found in the right temporal pole.

REFERENCES. —¹*Med. Times and Gaz.*, 1872, ii, 541; ²*Trans. Pathol. Soc.⁴ Lond.*, 1885, 36, 17; ³*Klin. Monats. f. Augenheilk.*, 1931, 86, 23; ⁴*Jour. Pathol. and Bacteriol.*, 1931, 34, 385.

LINITIS PLASTICA. (See LEATHER-BOTTLE STOMACH.)

LIVER ABSCESS. (See AMOEBIASIS; LIVER, SURGICAL AFFECTIONS OF.)

LIVER EFFICIENCY TESTS. Robert Hutchison, M.D., F.R.C.P.

In an authoritative discussion¹ at the Medical Society of London gloomy views were expressed as to the value of these tests. Sir H. D. Rolleston pointed out that, owing to the diversity of functions of the liver, one comprehensive test for total hepatic efficiency is not available. It is in acute disease of the liver that functional tests are most likely to be of value. The presence of bile acids in the urine by Hay's test and of latent jaundice by van den Bergh's give warning that changes are taking place in the liver cells, and these tests are easy to apply. In ordinary cirrhosis tests often fail. E. C. Dodds was of opinion that two tests may be of value: (1) the galactose tolerance test, (2) the estimation of bile pigments in the blood. The former is only of value in the differentiation of a very early case of jaundice in a middle-aged patient. In such a case a marked rise in the blood-sugar on giving galactose probably indicates catarrhal jaundice. On the other hand, no rise indicates that the liver cells are normal and points to an obstructive cause. The estimation of bile pigment in the blood is only of value in estimating the severity and progress of a jaundice. The icterus index is the simplest way of performing this test. The dye-excretion tests have not yielded valuable results.

Harrop and Guzman Barron² consider that the power of the liver to excrete bilirubin intravenously is the best method yet devised for testing hepatic function. They inject 1 mgrm. of bilirubin per kilo of body weight in an alkaline solution and determine the bilirubin of the blood by the method of Ernst and Förster. They found that in normal persons the whole dose of bilirubin is excreted within three to four hours. If the liver functions are disturbed there is delay.

J. P. Weir³ says that he has not found any help from the demonstration of urobilinogen in the urine; on the other hand, I. M. Rabinowitch⁴ seems to find it of value in certain instances. (See also *MEDICAL ANNUAL*, 1932, p. 286.)

Stockton Kimball⁵ contributes an elaborate study of the levulose tolerance test as carried out in 430 cases, with a review of the literature. He concludes that the test is sensitive and reasonably reliable. It is particularly a test for generalized hepatitis even of mild degree, and has much more value than is generally believed. By means of it such conditions as chronic alcoholic hepatitis and chronic non-suppurative hepatitis can be diagnosed.

REFERENCES.—¹*Lancet*, 1931, ii, 1227; ²*Abstr. in Amer. Jour. Med. Sci.*, 1931, July, 129; ³*Amer. Jour. Surg.*, 1932, March, 494; ⁴*Canad. Med. Assoc. Jour.*, 1931, Sept., 255; ⁵*Guy's Hosp. Rep.*, 1932, April, 157.

LIVER, SURGICAL AFFECTIONS OF.*A. Rendle Short, M.D., F.R.C.S.*

Cysts.—C. P. G. Wakeley and D. J. MacMyn¹ report two cases of non-parasitic cysts of the liver. The patients came up complaining of swelling in the upper abdomen. Probably these cysts are sometimes derived from the ligamentum teres, as they may shell out easily.

Abscess of the Liver.—F. K. Boland² (Atlanta) reports 19 cases, all in Georgia negroes; some were amœbic and others septic. As most of the cases had a mixed infection, aspiration was not indicated. The best treatment, in Boland's opinion, is a **Two-stage Drainage Operation**, shutting off the pleura on the first occasion and opening the abscess later. (See also AMOEBIASIS.)

REFERENCES.—¹*Lancet*, 1931, Sept., 675; ²*Ann. of Surg.* 1931, Oct., 766.

LOUPING-ILL.*Macdonald Critchley M.D., F.R.C.P.*

Louping-ill is a disease of sheep, especially prevalent in the tick-infested pastures in the border counties of England and Scotland. The name is derived from an old Norse word meaning 'to leap', and the disease is so called on account of the curious mode of progression seen in affected sheep. J. P. McGowan¹ and T. Rettie² in 1913 demonstrated the morbid changes in louping-ill, as comprising a diffuse encephalo-myelitis with lymphocytic infiltration of the pia and of the grey and white matter of the central nervous system. Histological similarities were emphasized between this affection and poliomyelitis in man. W. A. Pool, A. Brownlee, and D. R. Wilson³ showed that louping-ill is due to a filtrable virus with neurotropic properties. It has been transmitted to mice and to monkeys.

E. W. Hurst⁴ also successfully inoculated monkeys, producing clinically a progressive ataxia. The morbid change consisted in a diffuse encephalo-myelitis with massive destruction of the Purkinje cells of the cerebellum. In the mouse, though not in the monkey, Hurst demonstrated within the nerve-cells structures which were probably in the nature of inclusion bodies. G. M. Findlay⁵ confirmed the susceptibility of the Purkinje cells in the monkey towards the virus of louping-ill; he confirmed also the finding of A. Brownlee and D. R. Wilson⁶ that, as in the case of mice and pigs, the neuronie damage was not proportionate to the degree of interstitial change. Findlay was unable to find inclusion-bodies in the monkey, though, like Hurst, he readily demonstrated them in affected mice. Intracerebral inoculation of sublethal doses of the virus of louping-ill produced immunity in monkeys, as also in sheep. The curious transmissibility of this virus to sheep, mice, and monkeys recalls another veterinary virus affection, namely Rift-Valley fever, although the latter is not known to possess neurotropic properties. No cross-immunity exists, however, between louping-ill and Rift-Valley fever (Findlay). J. R. Greig⁷ has described the mode of infection of the sheep with the louping-ill virus; experimental evidence suggests that the affection is conveyed by the tick—*Ixodes ricinus*. A sheep inoculated against louping-ill still remains unprotected against tick-borne fever, however, suggesting that these two disorders of sheep are not identical.

REFERENCES.—¹*Lancet*, 1932, ii, Editorial; ²*Jour. Pathol. and Bacteriol.* 1913-14, xviii, 47; ³*Jour. Comp. Pathol. and Therap.* 1930, xliii, 253; ⁴*Ibid.* 1931, xlv, 231; ⁵*Brit. Jour. Exper. Pathol.* 1932, xiii, 230; ⁶*Jour. Comp. Pathol. and Therap.* 1932, xlv, 67; ⁷*Trans. Highland and Agric. Soc. Scot.*, 1932.

LUDWIG'S ANGINA.*Sir W. I. de C. Wheeler, F.R.C.S.I.*

Hamilton Bailey¹ shows how the infection of the cellular tissues in the region of the submaxillary salivary gland may arise from several sources. It is as urgent to decompress by drainage the infected area in Ludwig's angina as it is in osteomyelitis. There are all the dangers of impending septicæmia

combined with the possibility of early œdema of the glottis. In the early cases, a *deep* incision is made along the middle two-thirds of a line joining the symphysis menti with the centre of the hyoid bone. A forceps is inserted and thrust upwards until its blades protrude almost beneath the sublingual mucosa. If the disease is limited to one side, the beak of the forceps is pointed in that direction. The blades of the forceps are opened. A drainage tube is passed into the incision, and copious dressings soaked in hot **Magnesium Sulphate** solution are applied. In more advanced cases the incision should be transverse and should divide the hyoid muscles. The facial artery will need ligature and division. The submaxillary gland is retracted while the mylohyoid muscle is divided.

General anæsthesia is often dangerous, especially gas-oxygen. A certain degree of local anæsthesia is possible by blocking the cervical nerves behind the posterior border of the upper third of the sternomastoid. The reviewer uses light colonic ether anæsthesia in all these cases. Tracheotomy instruments should always be at hand.

REFERENCE.—*Practitioner*, 1931, Sept., 365.

LUNG, ABSCESS OF.

W. H. Wynn, M.D., F.R.C.P.

CLASSIFICATION.—R. A. Young,¹ in opening a discussion, points out that it is difficult to classify the types of lung abscess and their causes, since the mode of origin is often complex, involving questions of vascular occlusion, as well as the action of pus-producing bacteria and the saprophytic or pathogenic action of anaerobic organisms and various spirochaetes or treponemata. They may be :—

1. Abscesses due to inhalation of foreign bodies or infective material into the bronchi, especially during operations on the nose and throat, or to septic conditions in the nose and nasopharynx apart from operation, i.e., 'inhalation abscesses'. It is surprising that in a considerable number of cases after operation the abscess occurs in the upper lobe.

2. Parenchymatous abscesses, or abscesses originating in the lung parenchyma, due to what is often called a 'pneumonitis', e.g., the so-called meta-pneumonic abscesses.

3. Embolic abscesses. These are usually multiple and result from septicæmic conditions, especially right-sided infective endocarditis, and from distant septic processes such as otitis, appendicitis, and infective thrombophlebitis.

4. Abscesses from extension of suppurative processes in adjacent structures, notably the bronchi, mediastinum, abdominal organs, or from the vertebrae; among this group may be included 'bronchiectatic abscesses'.

5. Abscesses from breaking down new growth or from necrotic changes in adjacent lung tissue produced by obstructed vascular supply. Such abscesses are often in unusual situations and may give rise to difficulty in diagnosis. They form about 10 per cent of cases.

6. Abscesses from perforation of the chest wall and severe injury involving fracture of ribs.

7. Gangrene of the lung occurs under like conditions when the infective agent is specially virulent or the patient's condition is enfeebled.

DIAGNOSIS.—One of the conditions which most simulate abscess is interlobar empyema. The distinction may be impossible. The diagnosis may be suggested by the metapneumonic history and by the situation in the axilla extending into the interseapular space. If rupture occurs, the absence of elastic tissue in the pus is significant. Bronchiectasis may give rise to more difficulty, but lipiodol usually establishes its presence. New growth may be difficult to exclude, since abscess often coexists, but a study of the skiagrams

PLATE XXX

ABSCESS OF THE LUNG

(P. KERLEY)

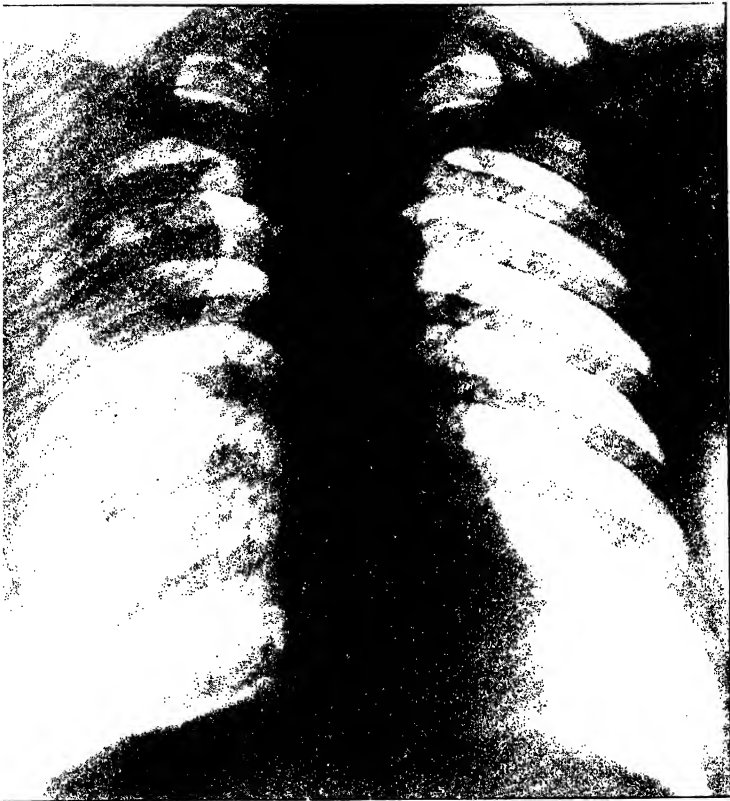


Fig. 4. Embolic abscess in the right upper lobe.

*Plates XXX, XXXI by kind permission of the
'Proceedings of the Royal Society of Medicine'*

with lipiodol and sometimes bronchoscopic investigation may prove the real nature.

In diagnosis the history affords great assistance. The occurrence of severe or fulminating pulmonary symptoms after operations on the nose or throat or after inhalation of a foreign body should lead at once to suspicion. In cases of delayed resolution after pneumonia severe and increasing fever, associated with the expectoration of obvious pus, especially if foetid, is significant. Similar acute symptoms after pulmonary infarction, with thrombophlebitis, after abdominal operations, in the course of infective endocarditis or septicæmia, or as a complication of middle-ear disease, should lead to a suspicion of abscess. The development of irregular fever with leucocytosis in the course of intrathoracic malignant disease should also suggest abscess. The onset, however, is not always acute and severe and the course is not always markedly febrile. Such abscess may only be revealed by X-ray examination. In cases of acute abscess the patient may be very ill at an early stage with severe fever and rigors. In chronic abscesses, especially after rupture, the fever is often irregular and to some extent periodic. Cough is often paroxysmal, like that of bronchiectasis, and may be caused by change of position. A significant symptom is an unpleasant taste or a foul breath. This often precedes rupture by days. When there is sudden copious expectoration of pus, especially if signs of a cavity appear, the probability of abscess is great. In chronic abscess the sputum approximates to that of bronchiectasis and is usually offensive. In gangrene it is extremely foul, and masses of necrotic lung may be seen. Hæmoptysis is common, occurring in 70 per cent. It may be profuse and even fatal. Pain is usual, and is often severe. Dyspnœa is marked in acute cases but may be slight in chronic. Rigors and profuse sweats may occur in the acute stages, but are not always present. Physical signs are often slight and equivocal. There may only be a localized area of dullness with weak breath-sounds and a few râles. When signs of cavity develop rapidly after expectoration of pus the diagnosis is almost certain. Radiological evidence is most valuable. It helps to localize the abscess. When rupture has occurred a fluid level may be seen and is of great help. Lipiodol is useful in excluding other conditions. Blood-counts almost invariably show a leucocytosis up to 20,000 or 30,000. Elastic tissue is almost always present in the sputum. Bacteriological examination may show spirochaetes, treponemata, and anaerobes, and suggest the use of arsenical compounds. Exploratory puncture is dangerous and should not be used.

P. Kerley² states that the X-ray appearances of lung abscess vary according to the method of infection, its nature, and the reaction of the surrounding lung. An embolic lung abscess in its early stage appears as a round, sharply defined, homogeneous opacity (*Plate XXX*). It has been shown post mortem that only the centre of the opacity is infected, the outer two-thirds being produced by non-infected consolidation. There is no fluid level and no inflammatory reaction in the lung outside the embolized area. The spread of the infection from the centre to the periphery may take a few days or weeks. If it spreads rapidly a sharp reaction, visible as a hazy opacity, develops round the abscess. A fluid level does not appear until the abscess has spread to the periphery and ruptured. Weeks may elapse before a fluid level is seen. Several workers have noted that lung abscesses when round and sharply defined may sometimes double or treble in size within twenty-four or forty-eight hours. This may be due to a second embolus lodging near the first. Radiography is the only means of diagnosing multiple abscesses. Usually two or three are surrounded by a common zone of œdematous lung, and because of this only one fluid level may be seen in the upright antero-posterior view.

If the patient lies on the diseased side, multiple fluid levels may be visible. The X-ray appearances of an aspiration abscess (*Plate XXXI*) are different. It is usually single and in the right lung. It is seldom found near the periphery, but tends to develop near the mediastinum or the hilum. It is not sharply defined in its early stage and appears as a vague ill-defined opacity which becomes sharper and denser as it becomes chronic. An embolic abscess may develop in any part of the lungs. It is usually near the periphery or in the middle of either lung, and is sharply defined to begin with. Lipiodol rarely runs into an abscess, but may run into bronchiectatic dilatations outside the abscess. 'The conditions simulating lung abscess radiologically are interlobar empyema, bronchial carcinoma, tuberculosis, and syphilis. An interlobar empyema may resemble either an embolic or aspiration abscess, and the differential diagnosis depends entirely on the lateral view. Early infraclavicular tuberculosis may give identical appearances to embolic abscess. Any round opacity in the infraclavicular region should be treated as tuberculous unless there are typical symptoms of abscess. Skiagrams taken at intervals of fourteen days will usually solve the problem. If the shadow is tuberculous little or no change will have taken place, while an abscess will show considerable alteration.

TREATMENT.—R. A. Young¹ states that treatment should be medical in acute cases, at any rate until the suppurative process is localized. A notable percentage of cases recover completely under medical treatment after spontaneous rupture. The percentage is greater in upper-lobe abscesses. In the acute stage the patient is nursed, dieted, and treated like a case of acute pneumonia. When rupture occurs the patient should be turned towards the affected side, since with large abscesses there is risk of suffocation. Expectorants and various antiseptics and deodorants such as **Creosote**, **Guaiacol**, and **Syrup of Garlic** may be given. **Postural Drainage** is of great value, and if the condition permits, the patient should hang over the bed at least twice a day. Antiseptic inhalations are often comforting and the **Creosote Vapour Bath** may be employed in afebrile cases. In gangrenous cases and those with very fetid sputum **Arsphenamine**, **Sulpharsphenamine**, and **Salvarsan** may be used. The decision to employ **Surgical Aid** is a responsible one. As a rule unless there is satisfactory evidence of progress towards cure within six weeks it is wise to consider surgical intervention. If there are no signs of improvement after rupture, and if the cough and expectoration are exhausting, operation may be necessary much earlier. In cases in which the abscess though localized does not rupture, surgery should be employed early, since there is risk of the abscess becoming chronic with very thick walls and therefore less likely to cicatrize after operation. In localized gangrene early operation gives the best chance. In cases of chronic abscess leading to bronchiectasis surgery should not be delayed. Surgical treatment is also often urgently necessary in superficial abscesses which rupture into the pleura.

Bronchoscopic Evacuation is clearly only suitable for cases in which rupture has occurred and where there is a more or less open bronchus. It may certainly be of value in cases due to inhaled foreign bodies and infected material. **Thoracotomy** with evacuation and subsequent drainage is the most generally useful method. A two-stage operation may be necessary if the pleura is not adherent. **Artificial Pneumothorax** has been recommended, but Young regards it as undesirable because if there are extensive adhesions the collapse of the lung and emptying of the abscess are liable to be incomplete and there is also grave danger of rupture into the pleura. **Thoracoplasty** may have to be considered with large chronic abscesses or multiple abscesses, especially if there is secondary bronchiectasis. **Phrenic Avulsion** is often of value. The indications for it are: (1) When an abscess has evacuated

spontaneously but drainage is incomplete owing to the relation of the abscess to the bronchial opening. The rise of the diaphragm may be all that is necessary to permit gradual closing. (2) When bronchiectasis is developing owing to cicatrization and drag on the adjacent bronchi. (3) As a preliminary to thoracoplasty. **Lobectomy** may occasionally be the method of choice when a lobe is disorganized by the abscess and its effects.

V. E. Negus³ considers that a bronchoscopic examination should be made in every case of lung abscess. Local anaesthesia is used almost invariably. In cases with no sputum a bronchus may be blocked and can be freed, or drainage may be imperfect, and **Aspiration** combined with application of 10 per cent **Silver Nitrate** to the granulations may cause marked improvement. In post-operative cases the results of bronchoscopic treatment are very good, and cure may be expected in the majority. If the abscess is due to a foreign body and this can be removed, the patient will get well. Of 27 patients with lung abscess, 15 were cured by bronchoscopy. If cases of foreign body are excluded, 7 have been cured out of 19; 8 were improved and 2 were not improved; 2 died in spite of treatment. These observations take into account all cases, however unfavourable. In one, bronchoscopic treatment was not begun until twelve years after the onset; 139 bronchoscopies were required for the 27 patients. Observation shows that no prognosis can be made before bronchoscopic examination, nor can the number of treatments necessary be decided beforehand.

A. Tudor Edwards⁴ considers that there are two types of pleural effusion secondary to abscess. One is chronic and slowly forming and it does extremely well. But the condition is different when there exists a large pleural cavity in which there are practically no adhesions. There is a widespread infection of the pleura and much general reaction. He is convinced that drainage should always be carried out in a two-stage operation. In the second stage he diathermizes the lung over the abscess, using a button electrode for coagulation and removing it with a wire-cutting loop diathermy. This prevents the lodgement of emboli in the circulation and diminishes the chance of cerebral abscess. He prefers packing to drainage for a few days after the operation, as it keeps the abscess wider open and drainage can subsequently be carried out by a soft tube. **Pneumolysis** is a method to be considered in certain cases.

L. S. T. Burrell⁵ is impressed by the seriousness of abscess of the lung and the impossibility of advocating a single line of treatment. He is appalled by the number of patients who die if treated by simple medical means, and considers that surgery has not fulfilled the expectations which were formed in regard to it. If a foreign body is present, he agrees that **Bronchoscopy** should be carried out. An abscess which drains freely goes on towards cure, and by aspirating the abscess contents little more is done than to make the connection through the trachea patent. If the lung abscess is superficial, he thinks surgery is the best and safest treatment, but if it is central, and the case is seen early, he believes that the safest treatment is an artificial pneumothorax.

A. J. Scott Pinchin and H. V. Morlock⁶ consider **Bronchoscopic Drainage** an incomparable adjunct to medical treatment. The drainage is done twice weekly and at the same time 10 per cent **Gomenol** is instilled and seems to aid resolution. This line of treatment should be considered before surgical interference in all but exceptional circumstances. If the patient is improving, it should be continued for two months from the onset. The bronchoscope is usually the only method of getting the cavity filled with lipiodol, which is essential for accurate localization if the case should come to operation. They

have seen a pyopneumothorax occur as the result of an artificial pneumothorax in four cases, and on three occasions a complete recovery was made after drainage. It is interesting to note that a Continental worker has suggested and carried out with success in a number of cases this production of a pyopneumothorax with subsequent drainage as a curative measure for abscess.

(See also TONSILS, DISEASES OF.)

REFERENCES. ¹*Proc. Roy. Soc. Med.* 1932, Feb. 3, 1132; ²*Ibid.* 1143; ³*Ibid.* 1147; ⁴*Ibid.* 1150; ⁵*Ibid.* 1149; ⁶*Practitioner*, 1931, Sept., 335.

A. Tudor Edwards, M.Ch., F.R.C.S.

Most observers agree that pulmonary abscess should not be operated upon in the acute stage. H. Lilienthal¹ advocates operation in the acute case which is progressive, and holds the view that the rapidity of the progress and the virulence of its accompanying sepsis should be the determining factors in the decision to operate. There is a natural tendency in these abscesses to pass from an acute to a subacute stage, generally when the abscess ruptures into the bronchial tree. A certain proportion, varying in different series of cases from 10 to 30 per cent, clear up spontaneously. Those that do not clear up in this way, but, both by clinical and radiological examination, give evidence of becoming chronic, should be subjected to other treatment. When this stage is reached, W. B. Faulkner² advises diagnostic pneumothorax, and states that it allows pulmonary abscesses to be separated into three groups for treatment: (1) By conservative measures, postural drainage, bronchoscopy, and pneumothorax; (2) By conservative measures with supplementary minor surgical procedures, i.e., evulsion of the phrenic nerve; (3) By major surgical procedures, i.e., cauter-pneumectomy, partial thoracoplasty, or lobectomy. This would appear to be a somewhat drastic method of determining the line of treatment advisable. Even as a diagnostic measure, artificial pneumothorax involves a very definite risk of pulmonary rupture, resulting in acute virulent infection of the pleural cavity.

W. Whittemore³ states that in considering surgical procedures for chronic pulmonary abscess it must be remembered that there are more abscesses than the main one, and these vary in size from microscopic to naked-eye size and are often accountable for the unsatisfactory after-result. Lack of improvement may be associated with secondary hæmorrhage of a lesser or greater degree, and these factors indicate that it is better to operate on pulmonary abscess reasonably early than to wait for the chronic stage to be established.

E. Sergeant, A. Baumgartner, and R. Kourilsky,⁴ in discussing the surgical treatment of abscess of the lung, attempted to decide when a **Pneumotomy** or a **Pneumectomy** is the operation to be advised. If the abscess is still recent and if the surrounding bronchopneumonia does not tend to spread, simple pneumotomy will suffice. If the abscess is already old, with surrounding infected lung which is necrosing, drainage will result in a period of deceitful calm. It is these cases, however, which require removal with the diathermy knife of the surrounding area of lung, the site of a condition of chronic broncho-pneumonia.

I. Nanu-Muscel and N. Stoichitza⁵ state that as a rule acute cases should be treated medically and chronic cases surgically, and surgery should be adopted after eight to ten weeks. Treatment by artificial pneumothorax is strongly condemned. In chronic abscess, when no treatment or only palliative treatment has been given, the mortality is 60 to 80 per cent, and **Lobectomy** is advised in diffuse cases. Of their 20 cases, 4 were cured by symptomatic treatment and 5 died—2 from generalized infection, 2 from widespread

infection of the pleura resulting from rupture of adhesions during artificial pneumothorax treatment, and 1 a few hours after pneumotomy.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1931, Dec., 788; ²*Amer. Jour. Surg.* 1931, Dec., 646; ³*New Eng. Jour. Med.* 1931, Sept. 24, 630; ⁴*Presse méd.* 1931, Oct. 7, 1461; ⁵*Arch. méd.-chir. de l'Appar. respir.* 1930, No. 4, 295.

LUNG, POST-OPERATIVE MASSIVE COLLAPSE OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

D. Band² and I. S. Hall¹ discuss the post-operative massive collapse of the lung, and give an account of a clinical and experimental study. A combination of factors which predispose to the experimental production of massive collapse are mentioned.

For the preventive treatment of atelectasis pre-operative **Atropine** is valuable, but combined with morphia has the dangers associated with depression of the respiratory centre. The prevention of asphyxia and the prevention of accumulations of mucus in the respiratory passages are obvious measures to which the anaesthetist attends. **Carbon-dioxide Gas** should be at hand to keep the respirations at a sufficient depth. By its judicious use full aeration can be obtained at the end of operation. Dressings should be secured in such a manner that they in no way interfere with respiratory movement. The position of the patient may be altered to ensure full diaphragmatic excursion. Sedative drugs should be withheld until the patient has regained full consciousness. A spasm of coughing or retching leads to the expulsion of retained mucoid secretion.

The treatment of declared cases of post-operative massive collapse of the lungs must include the inhalation of **Carbon-dioxide Gas**. This is supplied from a cylinder containing 10 per cent of the gas in oxygen. The gas may be supplied direct to the patient from the cylinder through a length of tubing and a mask inhaler (*Plate XXXII*), or a bag may be interposed to act as a reservoir. The inhalations are administered for ten minutes every hour.

REFERENCE.—¹*Brit. Jour. Surg.* 1932, Jan., 387.

LUNGS, ACUTE ŒDEMA OF.

W. H. Wynn, M.D., F.R.C.P.

C. Lian¹ states that the most common causes of acute œdema of the lungs are aortic disease, arterial hypertension, and nephritis. Of these, aortic regurgitation is the commonest; next in importance are lesions of the mitral valve. Other causes are acute infections, intoxications such as those produced by asphyxiating gases and injections of adrenalin, cerebral embolism and thrombosis, thoracentesis, and abdominal paracentesis.

Lian concludes that insufficiency of the left ventricle and a vasomotor disturbance are necessary for its development. He discards the purely mechanical theory, the reflex aortic theory of Huchard, and Dieulafoy's theory of a renal toxin. There are three degrees of insufficiency of the left ventricle. The first is slight insufficiency, with dyspnoea and cardiac acceleration; the second, more marked insufficiency, with a gallop rhythm; and the third, marked insufficiency, with pulsus alternans and functional insufficiency of the mitral valve. Patients with crises of acute pulmonary œdema often have a permanent gallop rhythm. Moreover, in the same patient various manifestations may appear—cardiac asthma, acute pulmonary œdema, and angina pectoris. Several investigators have carried out experimental research on the development of acute œdema following injections of adrenalin. Frugoni has observed that when certain nerve influences are abolished by ablation of the stellate ganglion injections of adrenalin fail to produce pulmonary œdema. In the dog œdema is also prevented when the respiratory centre is inhibited by

morphine. The author believes that recent work confirms the conclusion drawn by Merklen and himself in 1909 that both insufficiency of the left ventricle and a vasomotor disturbance in the pulmonary area are necessary.

Acute pulmonary oedema often occurs during the night. There is first a feeling of tightness in the throat which causes coughing. The paroxysms are frequently painful and there is much embarrassment of respiration. The sputum is abundant, mucoid, and often blood-tinged. On auscultation the chest is found full of all kinds of râles. A favourable termination usually follows **Venesection**, but if the intervention is delayed, the dyspnoea increases, the extremities become cold, the heart becomes irregular, the circulation fails, and death results from progressive asphyxia. The sputum is very rich in albumin, but contains little mucin or fibrin. It may show intact bronchial cells and leucocytes filled with pigment. A definite increase of blood-pressure often precedes an attack and may persist during the attack. In other cases there is a progressive lowering of blood-pressure. These are the cases with marked cardiac insufficiency. Following the attack albuminuria is present for a time even in the absence of nephritis. The attacks of acute oedema recur in spite of strict treatment.

Various clinical forms may be distinguished: (1) The bronchoplegic form which is very fulminating and may be fatal before expectoration begins; (2) Attenuated forms, which may be confused with pseudo-asthma; (3) A so-called localized form; (4) A form closely resembling the condition present in mitral stenosis with pulmonary congestion; (5) The form found in acute infections, in which the picture is apt to be less definite and the attacks may be very mild or very severe; and (6) The acute pulmonary oedema which is produced by the asphyxiating gases used in warfare.

The diagnosis is not difficult. The condition must be distinguished from asthma of a cardiac origin, true asthma, and angina pectoris. In all these the sputum is quite different. The prognosis is largely based on the ease and abundance of expectoration and the resistance of the cardiovascular system. Abundant sputum is a favourable sign.

TREATMENT.—Prompt **Venesection** is the treatment not only of choice but of necessity. When a patient has had one attack, those with him should be prepared to carry this out without waiting for the doctor. As a rule it is necessary to remove from 500 to 800 c.c. **Morphine** should be administered unless there is a serious associated nephritis. Finally an intravenous injection of **Ouabain** should be given and repeated after from three to five days. The patient should have absolute rest. **Theobromine** should be given and the diet regulated. The circumstances of the attack should be looked into and all precautions taken to prevent a recurrence. During convalescence the administration of **Digitalis** is advisable.

REFERENCE.—¹*Arch. méd.-chir. de l'Appar. respir.* 1931, vi, 345.

LUNGS, CONGENITAL DISEASES OF. W. H. Wynn, M.D., F.R.C.P.

P. Kerley¹ calls attention to the abnormalities of the lobes of the lungs. He considers that congenital diseases of the lungs are at least as frequent as those of the heart, but they find no place in text-books, because they cannot be diagnosed by the usual clinical methods. We are just beginning to realize that they can be diagnosed by radiography.

The normal *azygos vein* arises from a branch of the ascending lumbar vein, at the level of the 2nd lumbar vertebra; it runs upwards along the spine as far as the 4th dorsal vertebra, where it arches forwards over the root of the lung, to enter the superior vena cava. It collects blood from the majority of the intercostal spaces, and connects the inferior and superior venæ cavae. Under

certain circumstances it does not arch over the root of the lung, but runs outwards behind the upper lobe, crosses the lobe just below the apex, and runs downwards across the front of the lung to join the superior vena cava. When it takes this course it makes a deep indentation in the upper lobe and splits the upper lobe into two separate anatomical entities, with a different vascular and bronchial supply. The condition may be familial, and is probably always due to an abnormal shortness of the right main bronchus. With this malformation there is occasionally no middle lobe on the right side, and the lobe cut off by the azygos vein is supplied by a special mediastinal branch of the eparterial bronchus. At a modest estimate the abnormality occurs in 1 of 200 normal individuals. Clinically the condition cannot be diagnosed, although it is a frequent source of disease. If the vein crosses the top of the lung close to the mediastinum, there is invariably some restriction of the air-supply to the medial part. This is accompanied by some congestion of the medial part and compensatory emphysema of the peripheral area. Clinically fine râles can be heard over the apex, and invariably tuberculosis is suggested. On the radiograph the compensatory emphysema, standing out in marked relief to a linear shadow bounding an area of diminished translucency, looks very like a spontaneous pneumothorax, but the V-shaped end to the linear opacity proves it to be an azygos vein deformity. Not infrequently lobar pneumonia develops in these cases, and when it does there is invariably delayed resolution or even abscess formation. The radiographic appearance of a pneumonic azygos lobe is easily confused with a substernal thyroid, or with a bunch of enlarged paratracheal glands.

W. J. Mowat² points out that a shadow caused by the azygos vein can sometimes be seen in radiographing the œsophagus. The shadow is a small oval, about $\frac{1}{2}$ in. in its longest diameter and of the same density as the aortic shadow. It lies in contact with the right postero-lateral aspect of the œsophagus at the level of the 4th or 5th dorsal vertebra. Above and below it is continuous with that part of the shadow of the great vessels formed by the superior vena cava. The shadow must represent the end-on view of the horizontal portion of the vena azygos. This shadow can be clearly seen, but at a higher level in cases showing an azygos lobe. The fact that the vein may throw a shadow in normal cases may be important under certain circumstances. It may exert sufficient pressure on the œsophagus to produce an indentation in the barium shadow, which may be taken for organic disease or an impacted foreign body. It may also be mistaken for a peri-œsophageal abscess. It would be interesting to note whether any alteration in the size of the shadow can be made out by taking oblique films in cases of thoracic neoplasm causing obstruction to the vena cava.

A more frequent and dangerous congenital lesion is an *anomaly of the lobar formation*. There is a definite tendency in man for the formation of a fourth lobe in the right lung, and a less marked tendency for the formation of a third lobe in the left lung. The fourth lobe on the right is present in all quadrupeds and is well developed in the higher apes. In no less than 40 per cent of normal persons evidence of accessory lobes can be found in a furrow running across the lower part of the lower lobes. Schaffner found a well-developed fourth lobe in the right lung in 15 per cent of normal individuals and a third lobe on the left in a slightly lower percentage. The interlobar fissure dividing an accessory lobe from the normal lower lobe is clearly visible on a radiograph. It is seen as a fine white line running outwards from the root of the lung to the diaphragmatic shadow. Like an azygos lobe, a basal accessory lobe may have a deficient aeration, but this depends on whether it has a separate bronchus direct from the main stem or whether it is supplied by the small

paracardiac branch of the lower lobe bronchus. In the latter case collapse and bronchiectasis are almost certain to result. The X-ray appearances of a collapsed accessory lobe are characteristic. With increasing deflation the lobe slowly becomes more opaque, its outer border becomes denser and straighter, and eventually the whole lobe sinks into the paravertebral groove, where it appears through the heart shadow as a triangular opacity. In the majority of cases bronchiectatic dilatation takes place in the collapsed lobe, and infection sooner or later follows. Up to the present many of the accessory lobes have been diagnosed as collapsed lower lobes and the collapse attributed to bronchiectasis. An examination of sixty proved cases of bronchiectasis in children showed that half of them lacked the typical symptoms of bronchiectasis, i.e., persistent cough and expectoration of purulent sputum with signs of general debility and toxæmia. This suggests that the old theory that infection plays a dominating part in causing bronchiectasis must be discarded. In many of these cases there is also some developmental abnormality of the bony thorax, such as fusion of two ribs, cervical ribs, or spina bifida occulta. A number of cases of carcinoma arising in an accessory lobe have been published.

REFERENCES. *Brit. Jour. Radiol.*, 1932, March, 224; *Ibid.* 1931, Dec., 592.

LUNGS, LIPIODOL INJECTIONS INTO.

W. H. Wynn, M.D., F.R.C.P.

The best method of injecting lipiodol into the bronchi is still a matter of discussion, and various workers suggest modifications in the technique.

W. J. Fenton¹ favours the *intralaryngeal route*. In the earliest attempts the throat and larynx were anesthetized with cocaine by means of a swab. This was unpleasant to the patient and caused so much discomfort that by the time anesthetization was complete he was not in the best condition to tolerate the introduction of the lipiodol. A method was designed by which both the cocaine and later the lipiodol could be injected through the larynx into the trachea by means of compressed air and with the aid of a laryngeal mirror. The following solution is used in the atomizer: Solution adrenalin (1-1000) 2 drachms; potassium sulphate (2 per cent) 2 drachms; cocaine hydrochloride (10 per cent) 4 drachms (acid carbol 0.5 per cent as solvent). It has not been found necessary to use more than 25 min. of a 5 per cent solution of cocaine, and the major part of this is spat out of the mouth. Not more than 20 c.c. of lipiodol is injected the first time.

P. Franklin and A. Orley² use the *intranasal route*. The equipment required is: a gum-elastic catheter No. 6 or 7, a 40-c.c. syringe, and a spray containing 4 per cent solution of cocaine. The patient is seated and the neck slightly extended. One nostril, the oropharynx, and the larynx are slightly sprayed with the cocaine solution. The sterilized catheter is gently passed along the floor of the nose until it reaches the posterior pharyngeal wall, when with a slightly increased pressure it passes without any difficulty directly into the larynx, because the deglutition reflex has been inhibited by cocaineizing the oropharynx. The presence of the catheter in the trachea is proved by listening to the inspired and expired air passing through: 2 c.c. of the cocaine solution are immediately introduced through the catheter. The patient is now ready for the introduction of the oil. The entire procedure should not take longer than three minutes. The patient is placed on the X-ray table, which is tilted into the Trendelenburg position. The injection of the oil is begun. In this position the oil readily flows into the upper lobe bronchi. To ensure an equal distribution in both lobes the patient is directed to turn first on the right side and then on the left. The oil flow is watched on the X-ray screen. When indicated a radiogram is taken. This should be done as soon as the bronchial

tree appears filled and before the oil has spread into the alveoli. The table is now put into the horizontal position and the injection of oil is continued. As before, the patient is directed to turn first on the right and then on the left side. In all about 40 c.c. of lipiodol are injected. The filling of the lower lobes is again observed on the screen and a radiogram taken.

E. Fletcher³ has attempted to simplify the technique of injection *through the cricothyroid membrane*. A special 20-c.c. syringe is used with a barrel greater in diameter and shorter in length than the usual one. The usual thumb-piece is replaced by a lever (*Fig. 48*). The piston is attached to the working arm of the lever by a rod and the other arm is screwed to the barrel of the syringe. The rod is attached to the piston by a universal joint. To the end of the barrel is fitted a bayonet joint. A special trocar-pointed needle with lateral holes fits the syringe. On this needle a shoulder may be placed to prevent penetrating the larynx too deeply. The injection may be made through the cricothyroid membrane or between two rings of the trachea. Some time before injection the skin is swabbed with spirit and painted with 1 per cent picric acid, and this area is protected with sterile cotton-wool and a bandage. Before injection the patient should bring up as much sputum as possible. The patient lies down, and using a syringe with a fine needle the skin is anaesthetized with 2 per cent novocain and adrenalin. With adults it is usual to inject 5 min. of 10 per cent cocaine into the larynx from an ordinary 1-c.c. syringe, but with children this is generally omitted in order to make the operation more rapid. The lipiodol syringe is filled and air expelled. The special needle is then gently pushed through the cricothyroid membrane until it is felt to enter the larynx, and the patient is sat up. The lever is held firmly and the tension on the lever is gradually released. If the end of the needle is in the larynx, bubbles of air will enter the syringe. When this occurs the injection is proceeded with. At any stage the position of the needle can be verified by gently releasing the lever. The X-ray picture is taken in the upright position. The authors claim that this method will be found considerably quicker and far more comfortable for the patient than those previously in use. It is not usually necessary to admit patients into hospital; provided the condition for which the investigation is made permits, the patient may be allowed to go after the investigation has been completed.

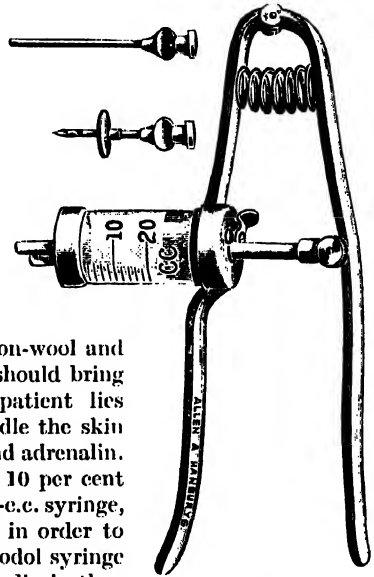


Fig. 48.—Special syringe, with filling tube (above), and needle with shoulder fitted. (By kind permission of the 'British Medical Journal'.)

REFERENCES.—¹*Lancet* 1931, ii, 230; ²*Brit. Med. Jour.* 1931, ii, 847; ³*Ibid.*, 846.

LUNGS AND MEDIASTINUM, PRIMARY GROWTHS OF. (See also INTRATHORACIC TUMOURS.)

W. H. Wynn, M.D., F.R.C.P.

The increased incidence of cancer of the lung has given rise to much speculation as to its etiology, but this remains as obscure as that of most cancers. Trauma, the inhalation of irritant dusts and fumes, and bacterial and toxic agents have all been suggested. W. Brockbank¹ investigated the occupations of 898 cases of primary lung cancer and found that, although no one

occupation stood out, the labouring classes predominated. The occupation in 62 cases was investigated with some detail; 9 had dusty work and 18 worked among gases and fumes, 4 were badly gassed during the war, and 9 smoked excessively. M. Gillespie,² in a group of 61 cases, found 33 men and 28 women, a larger proportion of females than in other series. Outdoor workers did not appear to be more prone to cancer than indoor workers, but chronic irritation appeared to play some part. Among the men no occupation occurred twice, and among the 28 women were 24 housewives, 2 schoolgirls, 2 dressmakers, a retired nurse, and a typist. W. L. Rogers,³ in 50 cases examined post mortem in Vienna, found that the study of environment or occupation proved of little significance. The occupations were varied and thirty in number. The largest number in any occupation was among the women, 6 being domestic servants.

An interesting point referred to by several writers is the distinct change in the conception of intrathoracic growths during the last thirty years. At the beginning of the century emphasis was placed upon tumours arising in the mediastinum, and little attention was paid to those arising in the lung. Tumours of the lung are now considered in far more detail, and mediastinal growths, though prominent clinically, are being regarded as pathologically correlated with those of the bronchi. Thirty years ago lymphosarcoma was held to be the most common tumour of the mediastinum, but now mediastinal tumours are regarded as carcinomata arising in bronchial epithelium, a view first stated by Barnard in 1926. The difference in emphasis appears to be partly due to a change in nomenclature and partly to a relative increase in tumours arising in the bronchi. M. Gillespie⁴ studied 39 cases available for histological classification. He found 4 spindle-celled sarcomata and 1 mixed-celled sarcoma—3 originated apparently in the lung and 2 from some mediastinal structure. There were 16 obvious carcinomata—4 squamous-celled tumours of the bronchi, 9 columnar-celled tumours of the bronchi, and 3 polygonal-celled tumours from the alveoli. In 16 the tumours belonged to the small-celled peribronchial type formerly considered sarcomata and now classified as carcinomata. There was 1 tumour of the thymus and 1 case of lymphadenoma. In none was a diagnosis of lymphosarcoma made.

W. L. Rogers⁵ reviews 50 cases of primary cancer of the lungs which came to autopsy in one year in Vienna. They formed 1.5 per cent of all autopsies, or 2.26 per cent of autopsies on persons over 30 years of age; 78 per cent were males and 22 per cent females; 48 cases showed primary bronchial carcinoma and 2 alveolar carcinoma. The types of carcinoma found were: (1) Small-cell, 68 per cent; (2) Squamous-cell, 20 per cent; (3) Adenocarcinoma, 8 per cent; and (4) Alveolar carcinoma, 4 per cent. There was an equal tendency to tumour formation in either lung; 46 per cent occurred in the upper lobes as compared with 28 per cent in the middle and lower lobes; 76 per cent were found in the right or left main bronchus or the first portion of the bronchi of the main lobes. The primary growths in the main bronchi metastasized to the mediastinal lymph nodes in a very early stage and were slower to metastasize by the blood-stream. A varying degree of bronchial stenosis is always present in cases of bronchial carcinoma and is often accompanied by bronchiectasis or abscess formation. Atelectasis of the involved lung is common. A pleural effusion was present in 52 per cent, but a hæmorrhagic exudate in only 10 per cent. There was a marked tendency to metastases to the bone, cerebrum, liver, and suprarenals. In 44 per cent the initial symptoms were pulmonary—shortness of breath, attacks of coughing, bronchitis, pain in the chest, hæmoptysis; 12 per cent began with pleurisy; and in 44 per cent the first symptoms were caused by the metastases in the nervous system, bones, stomach, and uterus. Three cases showed no pulmonary symptoms or signs.

In the more advanced cases the following signs were frequently noted : (1) The presence of a venous collateral circulation across the anterior wall of the chest ; (2) The shrinkage of one side of the thorax with a decrease in the intercostal spaces and a varying degree of retraction of the supraclavicular fossa ; (3) A lesser respiratory movement on the affected side ; (4) Tracheal deviation towards the affected side ; (5) Dullness on percussion from the tumour, collapse, pneumonia, or a pleural effusion ; (6) Paravertebral dullness from mediastinal involvement ; (7) Hyper-resonance in the remaining normal lung ; (8) Tympanic resonance in patients with large cavity formation ; (9) A lesser degree of respiratory excursion amounting to paralysis and upward retraction of the diaphragm on the affected side ; (10) Every possible type of breathing or rôle ; (11) A pleural rub. X-ray examination was made in 40 cases and the presence of a neoplasm was suspected in 72·5 per cent. In only 2 was the radiographer unable to rule out a tuberculous process ; both showed cavitation in an upper lobe. The findings leading to a suspicion of a neoplasm were—shrinkage of the affected side, the presence of an infiltrating process most often in the hilar region showing a marked tendency toward peribronchial infiltration, the presence of a bronchial stenosis characterized by partial or complete atelectasis, retraction of the heart and mediastinum towards the affected side, and upward retraction of the diaphragm on the affected side. In 10 per cent there was paralysis of the phrenic nerve.

Radiology.—P. Kerley,⁵ discussing primary lung cancer, states that there are two equally common X-ray manifestations. In one case a lung or a lobe is involved in a pneumonic process, and in the other the disease appears to be limited to the hilum. Certain radiological features are common to both, but as a rule they maintain distinctive appearances to the end. The appearances of the lobar or pneumonic form vary with the number of lobes affected. In the case of the right upper lobe the interlobar fissure is higher than normal, in the case of either lower lobe the greater fissure is seen to be nearer the spine in the lateral view. On the left side a deflated malignant upper lobe may so contract that the fissure is clearly seen in the antero-posterior view. A considerable degree of compensatory emphysema of the lower lobe is essential to produce this phenomenon. Primary lung cancer by obliteration of bronchi and destruction of lung tissue always diminishes the thoracic contents. On closer study of a lobar carcinoma it will be observed that the opacity is denser near the root and diminishes in intensity towards the periphery. If a very hard picture is taken, two opacities may be distinguished : the first an extremely dense one attached to and spreading from the hilum, the second a less dense one covering the affected lobe in all directions. These two shadows represent growth near the hilum and collapse in the periphery of the lobe. If the vascular markings are invisible in the light peripheral opacity and visible in the dense opacity near the root, we can diagnose carcinoma with certainty, for no other process produces this effect. The dense opacity is due to growth and the lighter peripheral opacity to simple deflation from stenosis of the bronchi. The large pulmonary vessels at the root are not obliterated, while the smaller vessels in the periphery are so reduced as to cast no shadow. If in association with a lobar opacity there is displacement of the mediastinum to the affected side, and if this displacement increases during inspiration, it is certain that there is stenosis of a bronchus not smaller than the first degree. Stenosis of a bronchus of the second or lesser degree has no influence on the mediastinal movements. Carcinoma is the commonest cause of bronchial stenosis in Europe. Diaphragmatic paralysis is an invaluable sign. Apart from surgical avulsion of the nerve, cancer of the lung is the commonest cause. On the right side the phrenic nerve runs directly through a few small glands

below the inferior branch of the pulmonary vein; on the left side it is clear of glands, hence the greater frequency of right phrenic paralysis. The nerve is at first compressed and later infiltrated by the glands, so that a growth complicated by phrenic paralysis means that it is inoperable. Compression or invasion of the vagus is less often seen. It results in disturbance of the cardiac rhythm, but more often in abdominal symptoms. The commonest abdominal disturbance is partial or complete gastrospasm with severe pain and vomiting. In rarer cases there may be spasm of the lower end of the œsophagus. The gastric symptoms may completely overshadow the lung symptoms in such cases.

Pleural effusion complicating a growth is the bugbear of the radiologist, as it masks other appearances. Withdrawal of the fluid may not help, for carcinoma of the pleura causes such great thickening that it is impossible to come to a definite decision between the appearances of the thickened pleura and diseased parenchyma. If the heart and mediastinum are not displaced when there is evidence of a large effusion, there must be some underlying condition. The weakest point in the mediastinum is at the level of the third dorsal vertebra posteriorly. If at this level there is displacement of the trachea and œsophagus to the healthy side while the heart below is displaced to the diseased side, we can be certain of three facts: (1) There is present a pleural effusion of at least 60 oz.; (2) There is collapse or fibrosis of the greater part of the underlying lung; (3) The collapse is not due to the fluid alone, for if it were, the heart would be displaced to the opposite side. In fibrosis the œsophagus is always pulled well away from the middle line and the trachea is always rotated. In collapse the œsophagus leans slightly to the collapsed side and the trachea is not rotated but moves as a whole to the collapsed side. When an effusion is associated with a paralysed diaphragm the diaphragm is depressed and on the right side the liver margin may be felt well below the ribs.

The chief conditions simulating the pneumonic type of cancer are tuberculosis, pneumonia, and syphilis. In these there is usually considerable fibrosis which can be demonstrated. Aneurysm causing collapse of the left lung or a lobe is a source of error because the collapse pulls the aneurysm and heart into the shadow of the collapsed lung. A hard picture with a Potter-Bucky diaphragm often shows the aneurysm clearly through the collapsed lung tissue. Secondary infection of cancer may cause an abscess recognizable by X rays. A fluid level in the centre of a collapsed area is easily recognized. If the abscess is complicated by diaphragmatic paralysis or grossly enlarged mediastinal glands, its nature is at once suspect.

The hilar form is seen as a dense opacity around the root of the lung without collapse or consolidation in the peripheral parts. It is easier to diagnose than the pneumonic form because there are few other conditions causing a similar appearance. A semicircular opacity with an ill-defined outer border and thick irregular lines radiating into the lung parenchyma are seen. The growth in such cases is not causing stenosis of the bronchi but is infiltrating through the bronchial walls and directly invading the lung. Lung markings are visible in the opacity and in the normal distal parts. Enlargement of the tracheo-bronchial glands can usually be demonstrated. Pleurisy seldom complicates this type until very late, but abscess formation is frequent. Obstruction of the superior vena cava takes place earlier and more often than with the pneumonic type. A sudden transition from the hilar to the pneumonic type is not uncommon. The only two conditions simulating the hilar type are lymphadenoma invading the lung and an unusual form of pulmonary syphilis. Lymphadenomatous invasion occurs late when there is usually generalized

glandular enlargement. With pulmonary syphilis there is always gross emphysema in the neighbouring lung tissue.

Occasionally a primary bronchial carcinoma causes no gross pneumonic changes but diffuses itself through the pulmonary lymphatics. An identical form may be seen secondary to a scirrhous carcinoma of the stomach or breast. On the radiograph are seen thin white lines spread out all over the lungs without any loss of translucency. Sometimes the primary growth remains limited to the bronchus, causes no obstruction and no mass about the hilum, but produces multiple round deposits in the lungs.

Thymic Growths.—D. Symmers⁶ has studied 25 thymic malignant tumours or tumour-like growths occurring in 17,000 autopsies. He found five different types—perithelioma from the connective tissue of small blood-vessels; lymphosarcoma from the lymphocytic elements; epithelioma from the epithelial reticulum cells; spindle-celled sarcoma from the connective-tissue framework; and finally Hodgkin's disease. In a considerable proportion of cases thymic growths display a tendency to confine themselves largely or even exclusively to the thorax, where, however, their ultimate degree of destructivity is scarcely to be paralleled in the domain of neoplasia. Particularly noteworthy is the propensity to destroy lung tissue by compression or direct infiltration, and to penetrate the pericardium and heart muscle. In spite of the extensive local invasion and destruction, symptoms and signs of increased intrathoracic pressure are not uncommonly delayed for a long period of time—sometimes up to a year. When such signs do assert themselves they are apt to do so abruptly and to progress with great rapidity. The thymic lymphosarcomata are apt late in their course to commence to pour their lymphocytes into the blood and produce an acute lymphocytic leukaemia. A small but extremely important group is associated with symptoms of myasthenia gravis. The association of a growth of the thymus has been noted in about 20 per cent of all cases of myasthenia gravis so far investigated post mortem. It occurs sufficiently often to be sought for in every case. Any type of tumour of the thymus may be found, and even simple hyperplasia.

REFERENCES.—¹*Quart. Jour. Med.* 1932, Jan., 31; ²*Glasgow Med. Jour.* 1932, June, 296; ³*Arch. of Internal Med.* 1932, June, 1058; ⁴*Glasgow Med. Jour.* 1932, July, 26; ⁵*Brit. Med. Jour.* 1932, March 5, 416; ⁶*Ann. of Surg.* 1932, April, 544.

LUNGS, TUBERCULOSIS OF. (See TUBERCULOSIS, PULMONARY.)

LUPUS ERYTHEMATOSUS. A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

F. D. Weidman and R. L. Gilman¹ describe a fatal case of acute lupus erythematosus in which the findings at autopsy were negative for tuberculosis. Endocarditis was present, though blood cultures during life had been negative. The authors consider that this disease can occur in connection with acute infectious processes, quite apart from tuberculosis, but this does not mean that the tubercle bacillus is incapable of provoking the same cutaneous expressions. They also consider that those cases of chronic discoid lupus erythematosus which precede the acute ones may possibly have a non-tuberculous as well as a tuberculous causation.

REFERENCE.—¹*Brit. Jour. Dermatol. and Syph.* 1931, Dec., 641.

LYMPHADENOMA. (See HODGKIN'S DISEASE.)

MALARIA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY AND PROPHYLAXIS.—The difficult question of the economic aspect of malarial prophylaxis in such an intensely malarious area as the tea estates in the Bengal-Doars is dealt with by E. M. Rice.¹ He found the spleen

index to be 90 per cent, and estimates that 55 per cent of the deaths are directly or indirectly due to malaria, and places the economic loss from the disease in six tea estates with a population of over 2000, and an average daily labour force of 1600, the capital value of whom represents one-third that of the estates, at 7.51 per cent of the capitalized value of the coolie labour force, or an annual loss of Rs. 60,736 (£4500 approximately). To reduce this loss by 50 per cent he considers that it would be justifiable to spend Rs. 12,147 annually, of which Rs. 9960 would be required for expert malarial surveys of the six estates, as otherwise more harm than good might be done, as has occurred through the removal of jungle that shaded trees, leading to breeding of a much more dangerous species of anophles.

G. C. Chatterjee,² of the Anti-malaria Society of Bengal, has recorded an interesting historical survey of the vexed question of the alleged influence of banking the rivers of the Bengal Delta in increasing malarial prevalence, and is largely in agreement with the well-known views of C. A. Bentley on the harmful effect on health of preventing the natural spill of the river waters by such embankments.

M. O. T. Iyengar³ has investigated the causes of the very low malarial rate in the salt-water lake area just to the east of Calcutta, and attributes it to the absence of the malarial-carrying salt-water-breeding *A. ludlowi* and the harmlessness of the prevalent *A. subpictus*. The same worker⁴ records that the dangerous *A. ludlowi* breeds in some of the tidal rivers of Bengal, including the Hooghly both twenty miles south and nineteen miles north of Calcutta, its spread near which city is causing some alarm. It is most prevalent in waters with a salinity of over 1.0 grm. per litre and also a small quantity of organic matter.

Recent work in Africa includes the following papers. R. M. Gordon and T. H. Davey⁵ report increased prevalence of quartan malaria in Freetown, and remark on the great paucity of reliable observations on the mosquito carriers of this variety of malaria. They regard *A. costalis* as the probable carrier in Freetown, but have not succeeded in proving it by feeding experiments. In Southern Nigeria D. Anderson⁶ found the malarial peak to occur early in the rainy season in relationship to the prevalence of *A. costalis*. J. H. Henderson⁷ reports on malaria among the indigenous tribes of the Upper Nile Province of the Sudan, where the spleen index is 50 per cent for children and $\frac{1}{2}$ to 1 per cent in adults. The benign tertian form of malaria becomes epidemic among the children during the rains. The probable carriers are *A. funestus*, *A. gambiae*, and *A. pharzensis*. Prophylaxis is very difficult in these ignorant tribes.

J. E. M. Boyd,⁸ in a long paper on malaria in the British Army in India, deals with the usual prophylactic measures, including mosquito wire netting for rendering barracks mosquito-proof; this is effective but very expensive. He concludes that "many of the suggestions made in this article are utopian and cannot possibly be carried out, even should the millennium be reached." The military malarial problem in Hong Kong is discussed by F. Harris,⁹ who points out that the city has become healthy as regards malaria through building and drainage operations, but out-lying barracks and camping grounds remain very malarious, and little has been attempted in the way of prophylaxis until in 1930 drainage and oiling operations were carried out at considerable cost, with good results in the case of two of the barracks, but not in another, where the main stream could not be oiled as it furnished the drinking-water supply. Quinine prophylaxis in a camp failed.

Among further reports on the prophylactic use of **Plasmoquine** the following may be mentioned. J. W. D. Megaw¹⁰ has analysed the tables in C. Russell

Amies' Bulletin, No. 5, of the Federated Malay States' Institute for Medical Research on "Plasmoquine in Subtertian Malaria", in which it was shown that such small doses of the drug as $\frac{2}{3}$ gr. every fourth day in addition to quinine rendered the patient's blood uninfected to the parasite, although the tables indicate that the crescents did not disappear from the blood much more quickly than under quinine. It is suggested that such a combination might prove an economical method of controlling malaria owing to the comparatively small amount of quinine required for prophylaxis. A. N. Kinsbury and C. R. Amies¹¹ report a field experiment on 330 adults on a highly malarious rubber estate to test plasmoquine prophylaxis by means of 0.04 grm. twice weekly, with parasite surveys every three months, and control observations on two neighbouring untreated populations both continued for a year. Clinically the subtertian and the benign tertian malarial cases were reduced from 30 and 52 per cent to 7.0 and 8.7 per cent respectively. The parasite rates showed about equal reduction in the experimental and control groups, but crescents disappeared from the blood of the former, the spleen index and hæmoglobin percentage improved slightly, and the general health greatly in the experimental group. The cost was about £70 per 100 labourers.

An important study of monkey-malaria and its transmission to man has been recorded by R. Knowles and B. M. Das Gupta.¹² In July, 1931, H. G. M. Campbell, in the Kala-azar Research Department of the Calcutta School of Tropical Medicine, found a scanty *Plasmodium vivax*-like infection of an African monkey, *Cercopithecus pygerythrus*, imported from Singapore, so Bass cultures were made and the infection has since been studied in 43 monkeys of seven different species. Twenty-three of these were the Indian *Macacus rhesus*, in which a fatal infection was often induced, with extreme multiplication of the parasites with invasion of up to 90 per cent of the red corpuscles, but yielding to quinine treatment if commenced in good time; sometimes it terminated with hæmoglobinuria. The anthropoid *Ilyobates hooleck* of Assam showed only a mild transient infection, and three human volunteers were successfully infected, one with a severe attack, although spontaneous recovery occurred in all three, and in man the morphology of the parasite rather resembled that of *P. malariae*, and the rosettes showed about ten segments. The natural mode of transmission has not yet been worked out, but as this strain is easily maintained in the laboratory it opens up a valuable field for experimental work.

The transmission of malaria in Amoy, S. China, has been investigated by Lan-chou Feng,¹³ who states that little is yet known about the transmission of the disease in China. He found malaria endemic in the villages, chiefly of the malignant tertian variety, and of the five varieties of anopheles present *A. minimus* was found to be the most important natural transmitter, for 30 per cent of caught specimens showed oöcyst infection, and 8 per cent showed sporozoites in the salivary glands. Natural infection was also found for the first time in *A. hyrcanus* var. *sinensis*, and *A. maculatus* may probably also be a carrier at times.

In a lengthy report on malaria in South Africa, H. H. Swellengrebel¹⁴ lays great stress on the importance of 'species sanitation'—that is, control of the breeding of the particular variety of anopheles which is the carrier in any area. In South Africa he found that only two of the twenty anopheles present were of any importance as carriers of malarial infection. First, *A. costalis*, breeding in small pools without vegetation as long as the rainfall continued with shorter intervals than seven days, caused epidemic prevalence of malaria, but the disease was much less prevalent in seasons with longer breaks in the rains. By locating the breeding places early in the season and oiling or filling up the pools

malaria could be greatly reduced, and the epidemics could be forecast by watching the local rainfall, and steps taken to lessen their incidence. Many large swamps are free from *A. costalis*, and the surest way to convert such harmless swamps into dangerous breeding grounds is to drain them and remove their vegetation, as puddles in the drainage furrows breed *A. costalis* freely. *A. funestus*, on the other hand, breeds in small shaded hill streams and is little affected by the distribution of the rains; it disappears at elevations above 3000 feet, and its presence is not always associated with much malaria. Estate malaria affects the labour forces of sugar plantations, and is worst among labourers imported from an area with little malaria into an endemic area. Among the white population **Quinine** prophylaxis is of great value when living among a highly infected native population, for 25 per cent of the *A. costalis* caught in native huts are infected with malarial parasites, and it is safer to sleep in the open than in or near a native hut. Cutting down vegetation is only of use along *A. funestus*-breeding hill streams. In the sugar belt in particular both a central and a local expert malarial staff is necessary for research and for giving advice regarding malarial prophylaxis in each affected area, and education in malarial sanitation is of the greatest practical importance.

TREATMENT.—The most interesting advance in treatment is the trial of a new synthetic drug, **Atebrin**, which appears to be complementary to **Plasmoquine** in that it destroys the non-sexual stages of the M.T. parasites but not the crescents. L. E. Napier and B. M. Das Gupta¹⁵ report on a trial in Calcutta of this preparation supplied by the Bayer laboratory and said to be allied to plasmoquine, although its composition does not appear to have been revealed nor is its price stated. It is less toxic than plasmoquine itself, and 0.1-grm. doses three times a day appear to be safe if given orally in tablet form after meals on four consecutive days, making a total of 1.2 grm. In children crushed tablets can be given in jam, or dissolved in water or milk. Charts are given of eleven patients, including all three varieties of malaria, one of whom had previously suffered from blackwater fever, which did not recur. The fever was controlled as a rule in an average of less than two days, the asexual forms of the parasites rapidly disappeared from the blood (on an average in 3.6 days), but in two cases crescents remained present until cleared up by the use of plasmoquine, and no unpleasant or toxic symptoms were met with, not even yellowness of the cornea which the manufacturers said might occur. One patient, given 0.1 grm. of atebrin the day before and for six days after being bitten experimentally by nine infected *A. stephensi*, remained free from fever; this indicates a prophylactic action, as the same mosquitoes induced malaria in two unprotected volunteers. These results are considered to be promising, although the drug appeared to act less rapidly than quinine. The same workers together with Dorothy Butcher¹⁶ have tested the prophylactic and curative value of both plasmoquine and atebrin in a highly malarious village near Calcutta, and they found that 0.01 grm. of plasmoquine three times a week in boys of 12, and half that dose in younger ones, so far from lessening attacks of malaria among them, was followed by 35 per cent of attacks in the treated boys against 11 per cent in the untreated, so this indicates a provocative action of plasmoquine. On the other hand, after treatment of 41 cases with a four-day course of a total of 1.2 grm. of atebrin, followed by a three-day course of a total of 0.06 grm. of plasmoquine, in only one were a few crescents found but no asexual stages of the malarial parasites, so atebrin in safe doses gave good results in this field test.

S. P. James, W. D. Nicol and P. G. Shute¹⁷ have tested atebrin in artificially induced malaria in England with very promising results. In an interesting paper on a study of an Indian and a Roman and Sardinian type of malignant

tertian malaria they show that the first is readily cured by quinine treatment, but the Italian strain relapsed repeatedly in spite of intensive treatment by quinine after each relapse. They then tried atebirin in a single 0.3-grm. dose every morning for five days, and found that not only did both primary and relapsing cases readily respond to the drug, but that in 17 cases only one relapsed, and that one was cleared up by similar doses for seven days, and did not again relapse during many weeks' observation; they therefore regard the new drug as one of great value in malaria. The treatment with atebirin has also been studied by R. Gr  n¹⁸ in the Malay States in 50 malarial cases, together with 46 controls treated with quinine bichloride. He found the new drug compared favourably with quinine in ridding the blood of malarial parasites and in relieving symptoms, and so far it appears to be superior to quinine in preventing relapses. It is not unpleasant to take, except for occasionally producing abdominal pains; if comparatively large doses are used its excretion is delayed and a yellowish discoloration of the skin may persist for eight to fifteen days after it is stopped. Like quinine it does not affect viability of the gametocytes of benign and malignant tertian malaria. The optimum dose for all kinds of malaria is probably 0.1 gm. per 15 kilos body weight given for six or seven days after a preliminary purge, and the urine should be examined daily for the drug, as its late appearance may indicate accumulation of the drug in the system. Further trials are necessary and the cost of the drug will be of importance.

Three clinical trials of atebirin by medical officers of the United Fruit Company are recorded in their medical department report for 1931¹⁹ with very promising results, for the fever ceased within three to four days and the patients recovered within a week. Relapses did occur in a few cases, but they were apparently less frequent than after quinine, so that as a rule a complete cure was obtained in 75 per cent to 100 per cent of the cases with a total of 1 to 3 gm. of the drug given either in 0.1-grm. doses three times a day or in a daily dose of 0.3 gm. The gametes did not disappear and might apparently be increased in number, so plasmoquine should also be given in such cases. The slight yellow discoloration of the skin in some cases is of no importance. Hemoglobinuria does not follow its use, so the drug appears likely to be of great value in cases of blackwater fever, and no toxic symptoms were produced, tinnitus being absent. Atebrin therefore appears to present distinct advantages where its high cost as compared to quinine allows of its use on a large scale.

C. Strickland and D. N. Roy²⁰ report three experiments of feeding *A. stephensi* with the blood of patients showing numerous crescents in their blood after treatment with atebirin. When fed on the final day of the treatment no development took place in the mosquitoes, on the day after the conclusion of the treatment scanty development took place, and two days later the parasites resumed their powers of development, so the injurious effects on the crescents were of very short duration.

The synthesis of antimalarial drugs is discussed by W. Schulemann²⁰ who has worked on it for long at the Bayer laboratories. The starting point was methylene blue, in one of the aromatic amino groups of which an aliphatic basic group replaced an alkyl radical with the production of a dye which Roehl found to be effective in bird malaria. This experience was then applied to the quinoline group, and after innumerable variations had been made plasmoquine eventually resulted, the basis of which, like that of quinine, is 6-methoxy-quinoline, and it has the important quality of being effective against the malignant tertian crescents.

J. Umansky²¹ recommends the intravenous injection of **Urotropine** in 3-c.c.

doses of a 40 per cent solution in the treatment of malarial coma, and states that the cerebral symptoms pass off slowly within three hours, although the malarial parasites remain in the blood, so he thinks the drug sweeps the capillaries of the brain and other internal organs. T. A. Hughes²² studied the effect of intravenous quinine on the electrocardiogram in man, and concluded that the most constant effect was a reduction in height or abolition of the T wave. Other effects noted were tachycardia, increase in the height and width of the P wave, shortening of the P-R interval, reduction in the height of the R wave, and increase in the S wave. Collapse was promptly relieved by 'Adrenalin.

J. H. St. John²³ has made analyses of the amount of quinine in the blood by the method of Vedder and Masen after given doses of the sulphate to determine the doses necessary to maintain a concentration likely to destroy the malarial parasites. He found that a single dose of 1.950 grm. produced a concentration of 3 to 6 mgrm. per litre, and 650 mgrm. every eight hours maintained a rate of over 6 mgrm. per litre, but 32-mgrm. doses failed to do so in all cases. Four-hourly doses of 650 mgrm. maintained rates of 10 mgrm. per kilo in 8 of 10 cases. Further work is required to find the doses necessary to prevent relapses.

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MALTA FEVER. (See FOOD AND THE PUBLIC HEALTH; UNDULANT FEVER.)

MASTOID DISEASE. (See EAR, DISEASES OF.)

MEASLES.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—In a survey¹ of the incidence and mortality of measles throughout the world from 1919 to 1931, it is stated that as regards the mortality figures, which are much more reliable than those for morbidity, considerable difference exists between the maximum and the minimum. In England, for example, the maximum, 19.2 per 100,000 reached in 1920, was three and a half times higher than the minimum, 5.9 in 1921; while in Germany the proportion was more than 5 to 1. In countries where measles is endemic its maximum frequency is at the end of the winter and in the spring. In Europe, for instance, 92 per cent of the annual maxima of morbidity occurred during the period December to May and only 8 per cent during June to November. The proportions of mortality during the same period were 78 and 22 respectively. Whereas, however, in Central and Western Europe the maximum mortality occurs in the winter and spring months, the peaks of the mortality-curve in Spain and Portugal were found in the hot season. In Eastern and Northern Europe as well as in Canada, where the winter is severe, the rise in morbidity and mortality occurs earlier than in more temperate climates.

SYMPTOMS AND COMPLICATIONS.—According to P. Lereboullet and P. Baize,² the incubation period of measles is not always so latent as the text-books

maintain. Of the symptoms described, some are rare, while others such as rise of temperature and increase of the polymorphonuclear leucocytes are of more value, and others again are too inconstant and ill-marked to be of assistance. The pathological interest, however, of the symptoms of the incubation period is indisputable, as they indicate a systemic invasion by the measles virus from the first.

P. Nobicourt and J. Lereboullet³ state that *acute pulmonary œdema*, which is an unusual complication of measles, most frequently occurs at the height of the disease. The onset is always sudden, being characterized by intense dyspnoea, rapid respiration and pulse, increased resonance of the chest due to acute emphysema, weak breath-sounds, and numerous fine subcrepitanant râles. Recovery takes place under appropriate treatment, but may be delayed by the supervision of otitis or bronchopneumonia.

D. Paulian and C. Aricesco⁴ report a case of *encephalomyelitis* in a girl, age 5 years, who during the eruptive stage of measles developed symptoms resembling acute disseminated sclerosis, consisting in dysarthria, intention tremor, dysmetria, difficulty in walking, spastic gait, and Babinski's sign, but without ocular symptoms and with a normal fundus oculi. Considerable improvement followed deep radiotherapy of the vertebral column and cerebellar region.

Cases of *acute myelitis* following measles have recently been recorded by F. B. Miller and A. G. Ross⁵ in Canada and by L. Babonneix and F. B. Lévy⁶ in France. The Canadian case was that of a girl of 11 who developed the symptoms during the eruptive stage. Gradual improvement took place, and when seen two and a half years after the attack her growth had been normal, she had complete control of her sphincters, could walk easily though with a slightly irregular gait, and could run on level ground though she was apt to stumble if it was rough. The French case occurred in a boy of 5½ years who a few days after a mild attack of measles developed complete quadriplegia with involvement of the nuchal muscles, sphincter disturbances, anaesthesia of the lower limbs, and Babinski's sign. Considerable improvement took place in the course of a fortnight. The condition was probably due to an acute myelitis involving the pyramidal tract, posterior columns, and anterior cornua.

F. G. Jenkins⁷ records a case of *early hæmaturia* in measles, which was probably congestive or toxic in nature, in a boy of 6 years who passed pure blood per urethram on the second day of disease, the rash appearing on the fourth. The blood disappeared from the urine six days after appearance of the rash, and subsequent recovery was uneventful. Skiagrams showed no evidence of calculi, and no albumin or blood was found on repeated subsequent examinations of the urine. A similar case is reported by P. Galli⁸ in a boy, age 7 years, in whom hæmaturia occurred during the eruptive stage. Recovery took place in ten days' time. The hæmaturia was regarded by Galli as due to hæmorrhagic cystitis and not to nephritis, as the quantity of urine passed was abundant, the amount of albumin was slight, and no renal casts or cells could be found. Other causes of hæmaturia, such as stone, tuberculosis, or tumour could be excluded.

E. Friedman⁹ refers to his previous paper on *enlargement of the spleen* in measles (see MEDICAL ANNUAL, 1929, p. 287) in which he refuted the experience of Bleyer, who found the spleen enlarged in more than half his cases of measles. Friedman has since examined 119 measles patients aged from 7 months to 10 years and found that only 13, or 10.8 per cent, showed any splenomegaly. In most cases the enlargement was very slight, and in only four was it considerable. The maximum degree of enlargement did not coincide with the height of the eruption nor was there any relation between

the frequency and degree of splenic enlargement and the severity of the attack of measles.

M. Herzberg¹⁰ reports a case of *appendicitis* in the prodromal stage of measles in a boy of 6 years. On laparotomy an inflamed appendix was found with the omentum slightly adherent to the cæcum and appendix. Histological examination showed marked follicular hypertrophy and numerous giant cells in the lymph follicles of the appendix. Four days after the operation the rash of measles appeared. This case confirms Warthin's suggestion of a distinct pathological change in the lymphatic structures in the prodromal stage of measles, and explains the frequent occurrence of abdominal symptoms suggesting appendicitis in the acute exanthemata.

PROPHYLAXIS.—P. Stocks¹¹ discusses the following methods: (1) Immunization of all home contacts with convalescents' or parents' **Serum**. He regards this as the more practical procedure and more certain in its results, although the total volume of an epidemic could not be reduced more than about 13 per cent by this means and only about one-third of the injections would have any useful result at all. (2) Immunization of all children at certain ages who have not had measles. This would be more problematical in its results, but it would present the theoretical possibility of reducing an epidemic temporarily to any proportions desired, though probably only thus make a larger epidemic inevitable later. (3) Exposure of children of certain ages to infection and giving them partial immunity by applying the measles virus to their nasal mucous membrane as recommended some years ago by Herrman, followed by subcutaneous injection of convalescent serum several days later.

A. Lichenstein¹² states that most of the convalescent serum at the Stockholm fever hospital is kept in a dry form, as it soon loses its efficacy if allowed to remain fluid. Dried serum is readily soluble in water and preserves its efficacy for several years. This method has been found particularly useful in diseases like measles and poliomyelitis, which are not endemic but may take on an epidemic prevalence at longer or shorter intervals.

G. Frie¹³ maintains that injection of convalescent measles serum is as valuable a method of preventing or attenuating an attack of measles in infants as it is in older children. During an outbreak of measles at the Paris Foundling Hospital a successful attempt was made to attenuate the disease by injection of 3 c.c. of convalescent serum before or during the seven to nine days after exposure. When the injection was given later, even after the period of invasion, the attenuation was less definite, but did seem to exist in spite of statements to the contrary made by various observers. The severity and fatality of the disease were much higher in infants who had not been given the serum.

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MEDIASTINUM, TUMOURS OF. (See LUNGS AND MEDIASTINUM, PRIMARY GROWTHS OF.)

MEDITERRANEAN FEVER. (See FOOD AND THE PUBLIC HEALTH; UNDULANT FEVER.)

MEGACOLON. (See HIRSCHSPRUNG'S DISEASE.)

MENINGITIS, STREPTOCOCCAL. (See STREPTOCOCCUS INFECTIONS.)**MENTAL DISEASE.** (See also ALCOHOL AND DRUG ADDICTION ; DEMENTIA PRÆCOX ; PSYCHONEUROSES ; PSYCHOSES.) *H. Devine, M.D., F.R.C.P.*

TREATMENT.

J. A. Holland¹ emphasizes the importance of a complete physical examination and of treatment on physiological lines. He states that physical examination reveals in practically every case the following pathology: loss of weight, pallor, abscessed teeth, infected tonsils, sinusitis, hypochlorhydria, intestinal stasis, endocervicitis, chronic myocarditis, low blood-pressure, leucocytosis, polymorphonucleopenia, lymphocytosis, and chronic infection in other less usual localities. Treatment rests upon, first, the removal of etiologic factors in so far as is possible, and, second, the rehabilitation of the patient. After carefully studying the individual patient, the first thing to do is to increase the weight by a high calorific **Diet** and forced feeding if necessary. Infected teeth and tonsils must be removed and **Vaccines** made from the infected tissues. **Colonic Irrigations** are used to secure proper intestinal elimination. After such treatments, or coincidentally with them, the writer strongly advises various forms of **Physiotherapy**—diathermy, sine wave, actinic ray, and colonic irrigations. **Diathermy** is especially recommended, as the writer believes that the intestinal stasis in many mental patients is caused by adhesions, and that these may often be satisfactorily treated by diathermy to soften them, followed immediately by sine wave treatment as well as colonic irrigations. Details of these methods of treatment are included in Holland's paper.

L. Minski² records his experience of injections of **Sulfosin** in 20 cases of *dementia præcox*, giving in his paper the effects of the injections on the temperature, blood-count, and blood-sugar. All the patients treated complained of severe pain at the site of injection. The muscles became indurated, and remained so, and stiffness and a limping gait as a result persisted for some time. Massages and exercises alleviated this. Twenty cases of schizophrenia were treated, 2 of whom recovered, 1 was much improved, 1 had a short remission, 1 became worse, and 15 showed no change. W. McCartan³ utilized the same method of treatment in 23 cases of *dementia præcox*, all of many years' duration. In no case is it claimed that complete normality ensued, but 7 cases showed varying degrees of improvement, and the remaining 16 showed no improvement at all. More favourable results of this method of treatment are recorded by J. E. Dhunjibhoy,⁴ of the Ranchi Indian Mental Hospital. Some of the cases were of a recoverable type, and this probably accounts for the more favourable effects of the treatment. The drug was tried on patients suffering from the following diseases: Schizophrenia of all types, such as simple, catatonic, stuporose, and paranoid, 18; Manic-depressive psychosis, 6, of which 2 were melancholics and 4 were manics of acute and chronic types. The results showed no improvement at all in 14; improvement in 7; and recovery in 4.

G. de M. Rudolph⁵ is responsible for a useful study of the various *experimental treatments of schizophrenia*. Twenty-three treatments are described and their relative values discussed, three series of untreated cases being used as controls. It is suggested that a common factor in all cases showing improvements is the ratio of the corpuscular bicarbonate to the corpuscular chloride, some treatments increasing the bicarbonate, some diminishing the chloride. The following treatments are considered from the standpoint of their effects upon course and outcome: salicylates, aseptic meningitis, pyrexial or shock

methods, vitamins, antiseptics, endocrines, sedative treatment (including somnifen), specific treatment (including thyroid extract and salvarsan), respiratory treatment (including assisted respiration).

A. G. Duncan⁶ has investigated the effect of thyroid administration on the blood-cholesterol in a number of mental patients. In 3 of the 8 dementia præcox cases a definite improvement coincided with the diminution of serum cholesterol; two of these were extremely dull, brightened considerably under treatment, and became apathetic after suspension; the third, a deluded man full of bitter complaints, lost his delusions and became mildly hyomaniacal, pleased with himself and all around him; he also returned to his former state when the treatment was stopped. One dementia præcox patient became worse and more hostile. In one melancholic increased agitation was the result. The one maniacal patient remained so until about three weeks after cessation of thyroid, when considerable improvement coincided with a great increase of blood-cholesterol. The remaining patients showed no change, except that both general paralytics became less amenable and more difficult to nurse. The patient with a post-encephalitic condition soon showed signs of thyroidism, and in the case of paralysis agitans the tremor was increased. The investigation was carried out to record cholesterol variations rather than clinical changes and therapeutic results.

Though **Thyroid Medication** is unsuccessful in the majority of schizophrenics, in a certain proportion of cases it would seem to be of benefit. R. G. Hoskins and F. H. Sleeper⁷ diagnosed 18 out of 130 subjects of dementia præcox as suffering from thyroid deficiency. Of these, 16 received thyroid treatment. Marked mental improvement occurred in 14, or 88 per cent, of the cases, and 5 became well enough to return home. In the control group of 41 patients receiving similar treatment the incidence of significant improvement was 34 per cent. There was probably some degree of thyroid deficiency in various subjects of the control, since 31 were recorded as showing 'endocrine deficiency unclassified'. The results of the investigation are interpreted as indicating that thyroid deficiency plays a significant rôle in more than 10 per cent of hospital cases of dementia præcox, and that in properly selected cases thyroid medication in adequate dosage and for a sufficiently prolonged period results in significant improvement. Little success is to be anticipated from thyroid treatment in cases selected at random.

Writing on *mental derangements in hypothyroidism*, E. P. Hayward and A. H. Woods⁸ point out: (1) That the classic mental picture of myxœdema is easily recognized, but decreased thyroid secretion may show itself through mental symptoms and signs which obscure the actual cause of the disease and mislead the diagnostician; and (2) When mental derangement is severe and consists both in slowing up of the intellect and in periods of intense fear, restlessness, hallucinations, and delusions, coupled with active resistance, not only does it obscure the disease picture, but it also makes it impossible to apply a basal metabolism test or even to test the blood-pressure. In these cases a wrong diagnosis is often made. The literature on the subject shows that a respectable proportion of hypothyroid patients exhibit marked psychotic symptoms, and unquestionably many of them have remained unrecognized. The writers give some interesting case histories which serve to illustrate their theme.

L. Minski⁹ gives an account of his experience in the use of **Nembutal** in psychiatric practice. Nembutal is sodium-ethyl-methyl-barbiturate. It acts quickly, is rapidly excreted, and tends to produce a lesser degree of restlessness than the other barbiturates. The drug can be obtained in capsules containing 1½ gr. In all the cases treated it was given by the mouth, and the

capsules dissolved in about a tablespoonful of water just before administration. It was found important to give it in a concentrated solution and on an empty stomach. In psychotic states the indications for treatment were taken to be : to decrease agitation and anxiety ; to allay motor restlessness ; to ensure sleep ; and to perform operations, such as lumbar puncture or the taking of blood for laboratory investigation, in non-co-operative and sometimes actively resistive patients. From the study of 53 psychiatric cases of widely different types and degrees of severity the following conclusions were reached : Nembutal in doses from 3 to 6 gr. is a hypnotic of the greatest value, not unpleasant to take, certain in its action, devoid of risk, and free from unpleasant after-effects ; as a continuous sedative in prolonged cases of excitement it has some value when combined with other drugs, such as **Hyoscine**, but it is much inferior to **Somnifen** ; no ill-effects were observed except in two patients who were extremely debilitated—in such patients, if used at all, the initial dose should be small (3 gr.) and cautiously increased ; no changes were observed in the urine or central nervous system, and no significant fall in blood-pressure was found except in the two patients mentioned ; there was little evidence of increased motor restlessness after the main effect of the drug had worn off ; it is quite exceptional for tolerance to be found, and it is doubtful if it occurs. There is, however, considerable individual variation in susceptibility to the drug.

Focal Infections and the Psychoses.—G. Gibier-Rimbaud¹⁰ records four interesting cases of schizophrenia that recovered after appropriate treatment of focal infections. It is recognized that acute infectious illnesses may be accompanied by mental symptoms at certain stages of their evolution, but the fact that focal infections may be responsible for the development of psychoses is often overlooked. The writer suggests that microbes of which we may all be the hosts, may, when the defences of the organism are enfeebled, become pathogenic and cause various pathological disturbances. It is well known that focal infections play an important part in the development of acute and chronic rheumatism, endocarditis, neuralgia, and fibrositis ; but in regard to the psychoses such causal factors are liable to be neglected. In the cases cited the main sources of infection were the teeth, but, where necessary, infection of the tonsils and nasopharynx were treated as well as the dental foci. In all the cases treatment for intestinal toxæmia was undertaken, and as early as possible **Auto-vaccines** were employed.

T. C. Greaves¹¹ writes on the treatment of psychoses attributable to unresolved infective foci, with special reference to the use of non-specific therapy in these cases. By the time mental symptoms appear the pathological state of the focus is advanced, the patient is frequently non-co-operative or resistant, the primary focus can no longer react by a discharge, 'open foci' have become 'closed', other foci may have developed and become dominant, and multiple infection has taken place and has affected all systems of the body. Treatment must first be directed towards mitigating the toxæmia and preventing further absorption by stimulating the reaction in each focus. To this end **Lavage** and **Antiseptics** are used locally, and **Alkalis** and **Antisera** are given. **Calcium Lactate Solution** in large doses by the mouth is a valuable adjunct, and appears to stimulate a focal reaction. The writer uses widely in these cases non-specific therapy—**Colloidal Sulphur** in oily or watery suspension and **T.A.B. Vaccine**. The focal effects of an injection consist of an active stage appearing within twenty-four hours—an area of increased vascularity, pain, swelling, exudation, and disturbance of function in or round any localized lesion ; and a stage of resolution, during which there is a progressive decrease in the inflammatory reaction until the *status quo ante* is reached or passed. If

the focal sepsis is 'open', the focal reaction may be enough to cause a discharge or a reduction of the persistent infection, with consequent cessation or mitigation of the toxæmia and mental recovery. When, however, the sepsis is 'closed', non-specific therapy is not likely to bring about recovery, especially if the focus contains necrotic material. The result is more likely to be increased toxic absorption, and exacerbation of symptoms. Colloidal calcium oleate will produce purulent reaction in dental roots and carious teeth where no such reaction was previously present. T.A.B. injections may stop a discharge from the cervix uteri, or bring about renewal of discharge from nasal sinuses which had 'dried up' although toxæmia persisted. Sometimes the re-activation is so acute that the discharges are hæmorrhagic. These injections are liable to provoke local sensory and motor disturbances of varying severity, and herpetic eruptions quite often follow T.A.B. injections. A number of general effects—pyrexia, nausea, vomiting—follow the injections.

The writer states that the removal and drainage of septic foci is an essential part of any treatment of these cases, but these may be insufficient to promote recovery; for this reason the combination of surgical treatment and non-specific therapy is often desirable. In the second part of this paper an account of the methods of treatment utilized in 15 cases is given in detail.

W. M. Ford Robertson¹² is responsible for a prolonged research on the pathogenesis of anaerobic microbial infections in the major psychoses, with control cases. The main purpose of this work is to develop the view that, if anaerobic cultural technique is omitted in the bacteriology of insanity, the greater and most important part of the flora is inevitably missed.

Writing on focal sepsis in mental disorder, A. Pool¹³ observes that the fact that chronic sepsis is as common in the sane as in the insane, and the difficulty of determining in any particular case whether a focus of sepsis is causal or incidental, constitutes the core of the problem. The writer points out that it is important to discover a method whereby, before we resort to wholesale dental extraction or other surgical intervention, we can confirm or eliminate a known focus of sepsis as the causative factor in any particular case. The present paper constitutes an attempt to answer this question. Bruce believed that the cause of mental disorder lay deeper than a toxæmia, being the result of a failure to form antibodies. Or in other words, in any particular case where focal sepsis exists, if the defence mechanism of the body (blood- and lymph-streams) were to 'rise to the occasion', these would prevent the occurrence in other parts of the body of remote effects consequent upon the local disease focus. If this hypothesis is correct, then, Pool observes, we have a ready means whereby in any particular case we can incriminate or exonerate a focus of sepsis as an etiological factor. This method is known as the 'pathogen-selective' method introduced by Solis Cohen in America, and utilized and elaborated in this country by Cronin Lowc. Essentially it consists in the use of the patient's own blood as a factor in bacteriological culture. Where antibodies have been formed and are present in sufficient quantity they will effectively inhibit organismal growth, and such organisms can then be ruled out as causative. A series of cases of chronic encephalitis, confusional psychosis, delusional insanity, and general paralysis were investigated by the writer in order to assess the rôle of chronic sepsis as an etiological factor. The 'pathogen-selective' technique was employed throughout, and its utility in incriminating or exonerating particular foci of sepsis is illustrated in three cases. This method adds bacteriological finesse to the preparation of autogenous vaccines, and makes them more selective in their action. Where this method is employed, unnecessary surgical intervention will be avoided,

and what is undertaken will be based on a demonstration of causal pathology.

REFERENCES.—¹*New Eng. Jour. Med.* 1931, Aug. 20, 371; ²*Jour. of Ment. Sci.* 1931, Oct., 792; ³*Lancet*, 1932, i, 340; ⁴*Ibid.* 1931, ii, 1407; ⁵*Jour. of Ment. Sci.* 1931, Oct., 767; ⁶*Ibid.* April, 332; ⁷*Amer. Jour. Psychiat.* 1930, Nov., 411; ⁸*Jour. Amer. Med. Assoc.* 1931, July 18, 164; ⁹*Lancet*, 1932, July 16, 127; ¹⁰*Presse méd.* 1931, Oct. 10, 1479; ¹¹*Lancet*, 1932, ii, 57, 115; ¹²*Jour. of Ment. Sci.* 1932, Jan., 12; ¹³*Ibid.* 1931, Jan., 137.

MENTAL DISEASE AND PERNICIOUS ANÆMIA.

H. Devinc, M.D., F.R.C.P.

Writing on the mental disturbances associated with pernicious anæmia, N. R. Phillips¹ points out that in this disease three main clinical manifestations have been recognized. Thus it may show itself as a blood disease, as a gastro-intestinal disease, or as a nervous lesion. It is, however, by no means generally recognized that pernicious anæmia may manifest itself by the occurrence of mental disorder. The degree of mental affection varies in different cases. There may be merely modification of character, with irritability and changing mood. In cases where the mental disturbance is more pronounced the psychosis most frequently met with is of the paranoid type, with delusions of persecution and suspicion, these delusions being more particularly directed against those who are responsible for the patient's welfare. Delirium, especially marked at night, occurs with remarkable frequency in this disease. The patient develops terrifying hallucinations, with extreme agitation and restlessness, and he reacts to these by becoming grandiose, abusive, and aggressive. There is nearly always some clouding of consciousness. Thus this mental syndrome resembles that of the toxic group of psychoses. The relationships of pernicious anæmia to the psychoses have been exhaustively studied from the medico-legal point of view, and in some cases a psychosis of this kind has considerably affected the testamentary capacity of its subject.

Phillips describes three interesting cases of mental disease associated with pernicious anæmia. In one patient, a female, aged 43, all the four manifestations of the disease were present—the typical blood condition, psychical disturbances, neurological symptoms, and achylia gastrica. Fresh **Liver** treatment was started at once, $\frac{1}{2}$ lb. of liver being given daily in various forms. As the patient did not tolerate this treatment well, liver extract had to be substituted. She was also given **Liquor Arsenicalis**, beginning with small doses gradually increased. She also had **Hydrochloric Acid** (1-drachm doses), with **Glycerin of Pepsin** t.d.s. She was given plenty of **Fresh Fruit**. The bowels were regulated, and **Medinal** was given for insomnia when required. The patient's health was too poor to justify the extraction of teeth at this stage. This treatment was, however, carried out subsequently. The results of treatment were gratifying; the psychotic symptoms cleared up and there was considerable improvement in the neurological condition.

I. Atkin² also records the recovery of a psychotic patient subsequent to the appropriate treatment of pernicious anæmia with which it appeared to be associated. The writer points out that mental symptoms may occur before the condition of pernicious anæmia is recognizable clinically, and may become so prominent that the underlying blood state may be overlooked. A feature of special interest in this case was the early signs of subacute combined degeneration of the spinal cord, and their amelioration under liver treatment. According to D. McAlpine³ the effect of liver on the neurological signs is variable, and he states that improvement is only slight once the Babinski reflex appears. In Atkin's case the neurological symptoms were attacked early—no Babinski signs having been obtained—and this may account for

the satisfactory response. In those cases of pernicious anæmia with psychotic symptoms that develop the signs of subacute combined degeneration, there is danger of diagnosing the latter as 'functional'. In fact the possibility of hysterical astasia-abasia was raised in this case at first. The blood examination settled this point at once.

REFERENCES.—¹*Jour. of Ment. Sci.* 1931, July, 549; ²*Lancet*, 1932, ii, 569; ³*Ibid.* 1929, ii, 643.

MESENTERY, TUMOURS OF. *A. Rendle Short, M.D., F.R.C.S.*

F. W. Rankin and S. G. Major,¹ of the Mayo Clinic, report on 22 cases of tumour of the mesentery. Sarcoma is the commonest. "The diagnosis is difficult, but given a mobile abdominal mass extrinsic to the gastro-intestinal tract, the possibility of mesenteric neoplasm should be borne in mind." It is more frequent than is generally supposed. In 7 cases cysts were found, 2 being chylous and 2 being sanguineous. These are favourable for removal. Some of the sarcomata were removed, but the prognosis is poor.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1932, May, 809.

MIDDLE-EAR DISEASE. (See EAR, DISEASES OF; OTITIS MEDIA IN INFANCY.)

MILK-BORNE DISEASE. (See FOOD AND THE PUBLIC HEALTH.)

MONONUCLEOSIS, INFECTIVE. (See GLANDULAR FEVER.)

MOUTH, CANCER OF. (See CANCER, RADIUM TREATMENT OF—ORAL CANCER.)

MUMPS. *J. D. Rolleston, M.D., F.R.C.P.*

SYMPTOMS AND COMPLICATIONS.—In a review of the recent literature on mumps, J. D. Rolleston¹ points out that the *incubation period* is liable to considerable variation, the extreme limits being three and thirty days. It is undoubtedly longer than that of any of the other common acute infectious diseases, and usually ranges between eighteen and twenty-two days.

One attack of mumps as a rule confers permanent immunity, and *second attacks* are so rare that Rolleston, like other physicians of considerable experience of acute infectious diseases, has never seen an example. A few instances, however, of repeated attacks are on record, the most remarkable being that of four attacks in the course of a year reported by Friedjung (see MEDICAL ANNUAL, 1922, p. 283).

Rolleston states that the close relationship between the frequency of mumps *orchitis* and sexual activity was illustrated during the war by French and German observers, who emphasized the low incidence of this complication in soldiers at the front or in the beleaguered garrison at Przemyśl where such activity was naturally suspended, as compared with its high incidence at the base where soldiers freely indulged their sexual appetites.

According to French observers, says Rolleston, *atrophy of the testicle* after mumps orchitis is much rarer than is usually supposed, and as a rule the organ returns to its normal condition. Twinem, however, maintains that sterility is often present without loss of sexual desire or potency and without any abnormality of secondary sexual characters.

A. Valerio² reports a case of bilateral mumps in a man, age 22, complicated by *seminal vesiculitis* on the fifth day of disease, as shown by pain in the hypogastrum, a sensation of weight in the anus and perineum, spontaneous and painful blood-stained ejaculation, and frequent and painful micturition.

On rectal examination the prostate was found to be normal, but both the vesiculæ seminales were extremely tender, swollen, and nodular, and on pressure gave issue to a mucosaneous discharge. No gonococci were found and there was no evidence of syphilis. Rapid recovery ensued under treatment by rest in bed, warm applications to the abdomen, and rectal suppositories.

A case of *mumps complicating pregnancy* is reported by J. H. Moore.³ The patient was a woman of 23 who developed mumps in the seventh month of her second pregnancy. The prodromal symptoms were very severe, consisting in high temperature, vomiting, cyanosis, and collapse. About a month later she was delivered of a still-born fetus showing signs of commencing maceration. The puerperium was uneventful.

A. S. Sandler and B. A. Finne,⁴ who record a personal case, state that the first example of mumps complicated by *appendicitis* was reported by Simonin in 1903, since when four other cases have been published, one of which was confirmed by the autopsy. The writers' case occurred in a boy, age 4 years and 8 months, who on the fifth day of an attack of mumps, in which only the right parotid gland was involved, developed symptoms of appendicitis. Laparotomy revealed a ruptured gangrenous appendix. *B. coli* was grown from the abdominal fluid. Recovery was uneventful. The patient's sister developed bilateral but uncomplicated mumps twenty-one days later.

DIAGNOSIS.—Owing to the frequency with which parents and even medical practitioners mistake hypertoxic diphtheria for mumps, Rolleston¹ urges that the diagnosis of mumps should not be made before carefully examining the fauces, though even before inspection of the throat the greater constitutional disturbance, nasal discharge, and characteristic factor indicates the presence of diphtheria rather than mumps.

PROGNOSIS.—Rolleston¹ remarks that though mumps usually ranks with chicken-pox as one of the mildest of acute infectious diseases, of recent years a number of severe and even fatal cases have been reported by French, Belgian, and Italian observers. (See MEDICAL ANNUAL, 1927, p. 321; 1929, p. 304.)

PROPHYLAXIS.—During an epidemic of mumps, L. H. Darenberg and J. Ostroff⁵ endeavoured to reduce the incidence of the disease by injecting susceptible children aged from 1½ to 3 years with the **Blood of Convalescent Patients** or with the same amount of blood from adults who had had mumps in childhood. They found that the average incidence of mumps in children so treated was 15 per cent as compared with a rate of 39 per cent in controls. Moreover, the attacks of mumps in those who contracted the disease in spite of inoculation were much attenuated. The results of injection of adult blood were not so good as those from injection of convalescent blood.

TREATMENT.—Rolleston¹ remarks that though comparative observations render it doubtful whether prolonged detention in bed makes the occurrence of orchitis less likely, yet in view of the close relationship between sexual activity and mumps orchitis (see above) erotic excitement of any kind should be avoided, as well as violent exercise, particularly riding or cycling, for some weeks after the attack.

REFERENCES.—¹*Practitioner*, 1932, cxxviii, 31; ²*Arch. Brasil. de Med.* 1931, 539; ³*Jour. Amer. Med. Assoc.* 1931, xcvii, 1625; ⁴*Arch. of Pediat.* 1932, 175; ⁵*Amer. Jour. Dis. Child.* 1931, xlii, 1109.

MUSCULAR DYSTROPHY.

Macdonald Critchley, M.D., F.R.C.P.

S. Barnes,¹ in his Presidential Address to the Neurological Society, 1932, dealt with a most interesting familial myopathic affection. The first member of this family known to be afflicted was born in 1749, and died in 1836; his descendants amount to about 500. Some 284 members were studied, either personally or from records.

The onset of the disease was usually late, appearing between 35 and 50 ; the progression was slow. Typically, the clinical course passed through four distinct phases. (1) The *hypertrophic* stage, in which there is excessive development and strength of the whole musculature : these Herculean properties correspond closely with Spiller's 'dystrophia musculorum hypertrophica vera'. (2) The *pseudo-hypertrophic* stage, which begins some ten to twenty years later, marks a decline in physical strength without alteration in the girth of the muscles : this phase may last for ten years, or even much longer. (3) The *atrophic* stage is ushered in by gradual atrophy and weakness in the muscles of the pelvic girdle and of the legs ; the psoas-iliacus is particularly affected. The tendon-jerks have become abolished, not only in the lower extremities, but also in the arms, which remain normal in size and strength. (4) The *terminal* stage is characterized by wasting in the distal parts of the upper limbs.

In many members of this family the tendon-reflexes were in abeyance, although no other muscular or nervous abnormalities could be demonstrated. Another striking feature of the myopathic members of this family was a tendency to adiposity. *Formes frustes* of the myopathy were relatively absent, as also were evidences of polymorphism.

TREATMENT.—In the MEDICAL ANNUAL, 1932 (p. 313), mention was made of the use of injections of **Pilocarpine** with **Adrenalin** suggested by Ken Kuré for the treatment of the myopathies. Making use of the known inability of the myopathic patient to retain ingested creatine, A. T. Milhorat, F. Techner, and K. Thomas² investigated various substances having a biological relationship with creatine. They were able to confirm the findings of E. Brand, M. M. Harris, M. Sandberg, and A. I. Ringer³ that the oral administration of the amino-acid **Glycine** is followed by a greatly increased creatinuria. Accordingly, they administered glycine (15 grm. daily) to a series of 6 patients with muscular dystrophies, 3 of whom exhibited the pseudo-hypertrophic variety. There resulted an immediate increase in the excretion of creatine ; after some weeks, the creatinuria decreased in amount, while the output of creatinine increased. These metabolic changes disappear a few weeks after glycine ingestion is stopped, and return when the drug is once more administered. Coincident with the biochemical alterations, an improvement is claimed in the clinical state. At first, a 'crawling, rumbling' sensation appears in the muscles, followed by a disappearance of the sense of fatigue. Motor power is then said to improve, so that activities can be performed which had been impossible for years. The authors suggest the biochemical reaction to glycine might be of value in the differential diagnosis of muscle atrophies, as in three patients with extensive wasting (not due to muscular dystrophy) there was no increase in the creatine output following the ingestion of glycine.

REFERENCES.—¹Brain, 1932, lv, 1 ; ²Proc. Soc. Exp. Biol. Med. 1932, xxix, 609 ; ³Amer. Jour. Physiol. 1929, xc, 296.

MYA'S DISEASE. (See HIRSCHSPRUNG'S DISEASE.)

MYOCARDIUM, DISEASE OF.

A. G. Gibson, M.D., F.R.C.P.

C. M. Bacon, H. K. Kretschner, and L. W. Woodruff¹ demonstrate the frequency of myocardial disease as determined by the electrocardiogram in 321 cases of *prostatic obstruction*. In 35.8 per cent there was clear abnormality. The diagnosis of myocardial damage was based upon slurring or notching of the QRS waves in at least 2 leads, the prolongation of the QRS complex beyond 0.1 second, and the inversion of the T wave in Leads I and II. In some cases the electrocardiogram was the only evidence available, and it is

urged that the risk of operation may be minimized by treatment before the operation if the electrocardiogram is abnormal. This treatment should consist in a period of **Cardiac Rest** together with an increased intake of **Fluids**. Patients with cardiac insufficiency require more prolonged rest with maintenance doses of **Digitalis**. In this series there were 4 post-operative deaths due to heart disease. As the result of the operation, relief from infection, freedom from pain, and the absence of frequent micturition at night, there was considerable improvement observed in a proportion of these cases. Of 15 with myocardial disease at the time of their first treatment, 8 were improved, in 5 of those the improvement was marked in the lessened tendency to oedema, in 8 cases with auricular fibrillation there was no change in the rhythm. From this series, therefore, it would appear that myocardial damage is no bar to operation for prostatic obstruction, but that previous preparation is desirable and subsequent improvement in the cardiac condition may be expected.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1931, Oct. 24, 1221.

MYOPATHY. (*See* MUSCULAR DYSTROPHY.)

MYOSITIS OSSIFICANS PROGRESSIVA. (*See* OSSIFICATION, DISEASES DUE TO ERRORS OF.)

NAILS, DISEASES OF. *A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

Onycholysis.—H. J. Templeton¹ records five cases of 'onycholysis', or separation of the nail from its bed, occurring in bottle-washers. In all cases the trouble began within a few days after commencing work. First blue or black spots appeared under the nails; these spread, and the nails separated from the nail beds. The process was free from pain and there was no discharge of pus, blood, or serum from beneath the nails. All the patients incurred the trouble while working at one particular plant, all doing the same type of work. They were engaged in washing paste off catsup bottles which had just been labelled. The bottles were first washed, then filled with catsup and capped. The catsup was then washed off and the bottles dried. Labels were then pasted on. All the work up to this point was done by groups of girls other than the bottle-washers. None of these suffered from nail disorders. The bottles, covered with paste were then delivered to the bottle-washers on a conveyor and were dumped into wooden wash tubs filled with lukewarm city water to which no chemicals had been added. The bottle-washers wore no gloves and used no soap. Their hands remained submerged in water a large part of the time. The author made a careful investigation of all possible irritants, but could find none; he believes that the disorder was precipitated by maceration of the tissues by prolonged immersion in water, plus, possibly, the mechanical insult to the tips of the finger-nails from picking at resistant pieces of paste. He also thinks that some personal factor may have been present which made the nails separate from the nail beds more easily than would those of normal individuals.

Onychia.—H. Haldin-Davis² calls attention to the occurrence of onychia (paronychia) as an occupational disease. He believes most cases of chronic onychia are caused by occupations which necessitate frequent immersion of the fingers in water and that the incidence of the complaint is probably encouraged when soda is freely used. He also considers that manicuring, especially the vigorous use of the orange stick, is an occasional cause.

Leukonychia.—P. L. Singer³ has investigated the occurrence of white patches in the nails, or leukonychia. He finds these present in 62 per cent of a series of normal persons, but more frequently in women than in men.

The white patches are due to the presence of keratohyalin cells and not to the inclusion of air, as has been thought in the past. The persistence of keratohyalin is due to decreased metabolism of the germinal layer, and may occur in many conditions in which the metabolic rate is altered.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1931, Dec. 26, 1950; ²*Brit. Med. Jour.*, 1931, ii, 845; ³*Arch. of Dermatol. and Syph.* 1931, July, 112.

NASAL SINUSES. (See NOSE AND NASAL SINUSES.)

NEPHRITIS. (See RENAL DISEASE.)

NEURALGIA, GLOSSOPHARYNGEAL.

Macdonald Critchley, M.D., F.R.C.P.

Although C. E. Dana¹ said of the glossopharyngeal nerve "it has no tic or palsy or algia . . . it receives only disregard and aloofness from surgeons and clinicians", his statement must not be accepted too seriously. Modern neurologists are familiar with a variety of tic douloureux which affects the territory of the glossopharyngeal nerve and which is cured by measures directed against that nerve. Numerous papers and reports have appeared within the last decade on this subject, but the latest review by W. S. Keith² may be quoted as bringing our information to date. To W. E. Dandy's³ 20 cases, collected partly from the literature, 17 additional cases have been added. According to Keith, the clinical data are as follows. Onset after 40. The pain typically occurs in paroxysms which are shorter and severer than in trigeminal neuralgia (Dandy). Movements of swallowing, and other activities of the mouth, pharynx, and tongue, precipitate the pain. A unilateral pain, commencing in the throat near the tonsil or root of tongue, is the commonest variety; it spreads to the ear, probably by implication of Jacobsen's nerve. Later, radiation may occur to the territory of the trigeminal or cervical nerves. Salivation may seem to occur. Of the 37 collected cases of glossopharyngeal neuralgia, 2 were due to carcinoma of the tonsil, and 1 to malignant disease of the larynx; 1 had an aneurysm of the internal carotid artery; and 1 had a cerebellopontine angle tumour.

The only certain method of treatment consists in an **Intracranial Section of the Glossopharyngeal Nerve**. No subjective disturbance in the throat follows the operation. Extracranial avulsion of the nerve is an easier and at times an adequate surgical measure.

REFERENCES.—¹*Arch. of Neurol. and Psychiat.* 1926, xv, 675; ²*Brain*, 1932, lv, 357; ³*Arch. of Surg.* 1927, xv, 198.

NEURITIS, PERIPHERAL.

Macdonald Critchley, M.D., F.R.C.P.

The Morison Lectures, delivered by James Collier,¹ in May, 1932, on the subject of peripheral neuritis, set out in a brilliant and arresting fashion the most recent conceptions of the nature and patho-physiology of this difficult subject. Collier deals first with the beginning of our knowledge of the malady; he reminds us of the interest taken by the Irish Post-graduate Robert Graves in a mysterious epidemic which was raging in 1828 throughout Paris. Although the clinical features of this disorder comprised severe and often fatal paralysis, no lesion of the central nervous system was demonstrable after death. This led Graves to the conception, expressed in the clearest terms, of disease of the nervous system commencing in the extremities and having no connection with lesions of the brain or spinal cord. "May not the decay and withering of the nervous tree commence occasionally in its extreme branches and may not a blighting influence affect the latter when the main trunk remains

sound and unharmed?" The next great advance in the conception of a disorder of the peripheral segments of the nervous system was made by R. B. Todd, who conceived of lead intoxication as implicating first the muscles and nerves and later the nerve centres. It was long, however, before these ideas gained acceptance, and neurologists for years bowed down to the term 'general spinal paralysis'. With the demonstration by Dumenil in 1864 of structural changes confined to the peripheral nerves, a new line of thought was opened up. The older and incorrect ideas as to the spinal origin of polyneuritis lingered on until about 1880. The title 'multiple, symmetrical, peripheral neuritis' was first applied in 1881 by Grainger Stewart.

Among the numerous principles formulated in these lectures, two or three may be singled out for quotation. Collier emphasizes that no strict separation can be made between parenchymatous neuritis and interstitial neuritis; that while there is a wide separation between the extremes of peripheral neuritis in which the trouble is purely axonic as in the paralysis of diphtheria and of lead poisoning, and the extremes of peripheral neuritis in which the trouble is purely interstitial, as in sciatica; yet every combination of the two conditions is of frequent occurrence, and is due to one and the same cause. Collier also submits that the tenderness of nerve-trunk and of muscle occurring in peripheral neuritis is entirely the result of interstitial lesions of nerve-trunk and of muscles; that pain does not occur in those forms of peripheral neuritis in which the lesion is purely neuronie, as for example in diphtherial, tetanus, and lead paralysis, even though the sensory neurons may be severely affected. The author not only doubts that degeneration or exotoxin fixation of the peripheral nerves ever gives rise to pain, but also that pressure on nerve-trunks ever causes pain. For peripheral neuritis to be of the painful variety there must be one or both of two lesions added to the neuronie disease; there must be either an interstitial lesion outside of and irritating the sensory nerve terminals, or there must be an interstitial lesion of the nerve-trunk. Collier lays particular emphasis on the mode of entrance of noxious agents into the nervous system; of their power of spreading to the uttermost limits of every nervous structure, often without any disturbance of nervous function; and of their discharge from the infected nervous system by the peripheral nerve endings into the saliva in the case of rabies and into the skin in the case of herpes zoster; and the possibility in the case of the virus infections of their living persistence within the nervous system for very long periods, with recurrences or increase of symptoms, very long after the original infection, as in the case of lethargic encephalitis and herpes. He takes the three diseases—rabies, tetanus, and diphtheria—in which the principle of exclusive neuronie acceptance and spread was first discovered, and argues that the phenomena of these diseases, however different they may seem, are truly phenomena of the same order, and that all three may produce the same type of flaccid peripheral paralysis.

Acute Febrile Polyneuritis with Facial Diplegia.—The past two years have witnessed the recrudescence of cases of acute infective polyneuritis. It will be recalled that similar revivals have been noted and described at intervals since the original communication of Pierson in 1869. Important studies followed, notably by W. Osler² and, during the World War, by G. Holmes³, J. R. Bradford, E. F. Bashford, and J. A. Wilson⁴, and by L. Casamajor.⁵ Numerous terms have been employed to describe the malady, such as 'acute febrile polyneuritis', 'infective neuronitis', 'meningo-encephalomyeloneuritis'. Papers dealing with the recent cases in the United States have been published by G. Wilson and H. F. Robertson⁶ and by E. W. Taylor and C. A. McDonald.⁷

Neurological symptoms usually appear without any preceding disability, but at times there are prodromata of general malaise, slight fever, and vague aching pains. In some cases an initial fever has been followed by an interval of improvement, of variable duration, at the end of which neuritic symptoms develop. Typically, there develops a weakness in the limbs, particularly in the proximal segments; usually the legs are affected before the arms. An interesting symptom, which is highly characteristic of the recent group of cases, consists in a bilateral facial paralysis. This symptom may precede, in exceptional cases, paralytic signs in the limbs; it is possible, too, that abortive varieties of this disorder may occur, as shown by facial diplegia alone. In a few cases other cranial nerves besides the 7th may be involved, and there may occur nystagmus, diplopia, ptosis, and dysphagia. There is but little muscular atrophy; the tendon-reflexes become unobtainable, and at times the abdominal and plantar responses also cannot be elicited. Paræsthesiæ are complained of in the limbs, but pain is usually slight. Deep pressure in the muscles and nerve tissues is always painful, however. Objective sensory impairment is usually present and may at times be pronounced. Sphincter control is usually normally maintained, but sometimes transitory minor disturbances are complained of. Psychical symptoms are usually not present, but in a few cases a confusional psychosis has been observed, recalling that of a Korsakow's syndrome. Mental symptoms are of serious prognostic significance. Another grave sign is found in an extension of the paresis to the respiratory mechanisms.

Changes in the cerebrospinal fluid almost always occur. The fluid may be yellowish in colour, the protein is usually much increased, the cells remaining normal or only slightly increased in number. Guillain has used the term 'cyto-albuminous dissociation' to describe this change. It is not very unusual, however, to find a moderate increase in the lymphocyte count in the cerebrospinal fluid.

The prognosis is usually stated as being favourable, both as to life and as to recovery of function. Paralytic signs have cleared up as a rule by the end of the sixth month. A number of the cases end fatally, however, the proportion varying considerably with individual observers. In the wartime series 8 out of Bradford's 30 patients died.

The cause of this syndrome is unknown; one is probably correct in ascribing it to a virus infection, but Bradford's success in transmitting the disease to monkeys has not been repeated.

Toxic Neuronitis of Pregnancy.—Cases of peripheral neuritis occurring in association with pregnancy or during the puerperium are well recognized, though they are inadequately handled in most of the text-books on neurology and on obstetrics. The monograph of R. Hoesslin⁸ constitutes the most important contribution on this subject, but a recent communication by N. J. Berkwitz and N. H. Lufkin⁹ has dealt carefully with the incidence of neuritis during pregnancy.

Modern conceptions look upon the neuritis as auto-toxæmic in origin, though Wechsler has lately queried whether a vitamin-deficiency factor may not be present. The disease seems to occur more commonly in the first and second pregnancies. Almost always the pareses are preceded by severe hyperemesis. By the third or fourth month of pregnancy, when the patient has been dehydrated and debilitated by the excessive vomiting, pains and paræsthesiæ commence in the lower limbs, followed or accompanied by weakness. Later the muscles of the arms and trunk become involved, and at times various cranial nerves. Changes in the optic discs may occur, such as papilloedema with hæmorrhages, and sphincter disturbances develop in 50 per cent. A

toxic confusional psychosis develops in about two-thirds of the cases. Death has occurred in one-quarter of the recorded cases. Berkwitz and Lufkin recommend that artificial induction of labour should be considered as soon as neurological symptoms appear. After abortion, the peripheral neuritis does not necessarily improve at once, and, indeed, complete restoration of function does not always occur. Relapse during a subsequent pregnancy has been described.

Neuritis and Radiculitis following Serum Therapy.—Neurological complications of serum therapy, although admittedly rare, have received a certain amount of attention, particularly from French authors. In this country a recent comprehensive survey has been made by I. M. Allen¹⁰; and from the United States contributions have appeared by Foster Kennedy¹¹ and by E. Wilson and S. B. Hadden.¹² Allen was able to review from the literature 42 cases of neuronic complications of the use of serum; antitetanic serum was concerned in 26 cases, while antistreptococcal, antidiphtheritic, antipneumococcal, and anti-scarlet-fever serum were less common pathogenic agencies. In many cases nervous lesions followed the first injections; usually they were associated with the ordinary symptoms of serum sickness, although this was not always the case. The clinical picture was that of an exacerbation of pains in the limbs coming on two to five days after the onset of serum sickness. At the same time, weakness and wasting of muscles occur, and the reflexes disappear. Objective sensory changes are slight or absent. Improvement occurs gradually, complete restoration taking place at any time up to eighteen months; occasionally, the disability persists.

Allen divides the neurological complications into four groups: (1) *Radicular*. This is the commonest type; the proximal segment of the limb is usually affected, on one side or both. Rapid wasting appears, chiefly in the muscles supplied by the fifth and sixth cervical segments, giving rise to a more or less complete Erb-Duchenne paralysis. Sensory impairment usually cannot be demonstrated, and deep pressure as a rule evokes no pain. (2) *Neuritic*. Here a single peripheral nerve seems to be affected (musculospiral; sciatic; external popliteal). (3) *Polyneuritic*. Here there develops a peripheral neuritis, characterized by generalized pains, weakness of the extremities, subjective and objective sensory changes, and diminution or loss of the tendon reflexes. (4) *Central*. Under this heading are included miscellaneous symptoms, such as papilloedema; hemiparesis; aphasia; meningeal symptoms. Numerous hypotheses have been raised to explain the pathogenesis of these cases; Allen believes that more than one factor must be invoked to explain all the cases. The 'central' symptoms and isolated peripheral nerve palsies might be attributed to local or general oedema, while the radicular cases might arise from inflammation or oedema of the nerve roots as they leave their dural envelopes.

The clinical association of polyneuritis with oedematous and urticarial states is further emphasized by a recent case recorded by S. B. Boyd Campbell and R. S. Allison.¹³ Their patient, a man of 21, developed urticarial patches over the body, and, a few weeks later, swelling, weakness, and numbness of the extremities. Definite peripheral neuritis was found on neurological examination. The authors attribute both the urticaria and the polyneuritis to an anaphylactic state.

A case of angioneurotic oedema accompanied by extensor paralysis of the forearm with muscular wasting has recently been reported by W. Mackay.¹⁴

Deficiency Polyneuritis.—I. S. Wechsler¹⁵ has recorded several cases of peripheral neuritis of obscure causation, in some of which an achlorhydria was associated. The diagnosis of beri-beri could be definitely excluded, and yet in all cases there was a history of vomiting, or starvation, or restriction of

the diet, suggestive of food deficiency as the etiological factor. In this way these cases are associated* with the polyneuritis of infantile gastro-enteritis, coeliac disease, and pellagra, as well as with the cases of neuritis occurring in undernourished prisoners. Wechsler remarked that some of his patients recovered when given diets rich in vitamins, and he raised the question of a possible avitaminosis as the causative factor.

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NEUROFIBROMATOSIS, MULTIPLE. (See VON RECKLINGHAUSEN'S DISEASE.)

NEUROSYPHILIS.

Macdonald Critchley, M.D., F.R.C.P.

Surface Tension of Serum in General Paralysis.—B. H. Shaw¹ has made a series of observations on the surface tension of human serums by suspending a small platinum ring (about 1 cm. in diameter, 0.0076 wire) by a light thread from a torsion balance and allowing it to float on the surface of the fluid (consisting of a thorough admixture of 0.25 c.c. of serum in 50 c.c. of distilled water). The suspended ring is then lowered on to the surface of the fluid, the lever of the instrument being evenly moved. The reading in milligrams just necessary to make the ring part company with the fluid, minus the weight of the platinum attachment, gives a measure of the surface tension. As precipitation soon occurs with high dilutions of serum, it is recommended that the estimation should be carried out as soon as possible after thorough mixing. The author found considerable variation in the surface tension of serum, but in all cases investigated there was a constant type of change occurring after the serum had been inactivated for 30 minutes at 56° C. In cases of G.P.I. the surface tension became distinctly less after inactivation; while in all other cases the surface tension was either raised or else unchanged. The author did not find this characteristic lowering of the surface tension in the serum of syphilitic patients without G.P.I., and the possibility of this test's being of help in the differential diagnosis of neurosyphilitic syndromes was suggested.

Syphilitic Hydrocephalus in the Adult.—Most text-books pay but meagre attention, if any, to the subject of hydrocephalus in the adult, resulting from acquired syphilis. J. S. Greenfield and R. O. Stern² suggest that the condition is not as rare as is perhaps believed, and they have succeeded in collecting 7 cases from the records of the National Hospital, Queen Square. The salient clinical features comprise headache of severe intensity accompanied by vomiting, giddiness, and difficulty in walking. The pain is often situated at the back of the head or neck. Papilloedema or consecutive optic atrophy may accompany the headache, testifying to its hypertensive origin. Attacks of unconsciousness, with or without convulsions, were present in 4 of the 7 cases. Cranial nerve palsies existed in all cases, oculomotor affections being most common. Often there were associated palsies of the face, jaw, palate, pharynx, and tongue, usually greater on one side, and indicating a widespread gummatous basal meningitis. Unsteadiness of gait, inco-ordination, hypotonia, and weakness of the arms were not uncommon, but sensory impairment and paresis were not prominent.

From the pathological standpoint the hydrocephalus is the result of syphilitic meningitis. Although usually of the communicating type, complete obstruction

of the foramen of Magendie is not rare, and the foramen of Luschka may also be sealed up by plastic meningitis. Minute gummata, sometimes of the miliary giant-cell type, are often present. Degeneration of the myelinated fibres in the periphery of the spinal cord also occurs in long-standing cases.

THE TREATMENT OF NEUROSYPHILIS.

The treatment of neurosyphilis still remains a contentious problem: Is treatment worth while? What results are to be anticipated? Should one treat vigorously or with forbearance? Which preparations and therapeutic measures are most efficacious? Questions such as those are still hotly discussed, but out of former contradiction and confusion some general conclusions seem to be emerging. Notable surveys of the present status of therapy have been made in the past three years by E. C. Menzies,³ H. H. Reese,⁴ and in particular by D. Lees⁵ in his Presidential Address to the Society for the Study of Venereal Disease. Some of the modern conceptions may be quoted as to the value and scope of particular measures.

Iodides.—Iodides are still favoured in the treatment of neurosyphilis. In conjunction with mercury (or bismuth) they usually constitute the sole measures employed during the first few weeks of treatment, particularly in cases of syphilitic cerebral vascular disease and gummatous meningitis. One usually employs 10 gr. of the iodide of potassium thrice daily, but many, like Lees, advocate higher doses, and suggest commencing with 15 gr. and increasing to 30 gr. Reese, on the other hand, thinks that large doses are unnecessary. Iodides have a particular value in the treatment of tabetic pains, and may be administered in the form of intravenous sodium iodide.

Mercury.—This remains popular, either in the form ofunctions and injections or by the mouth. With iodides, mercury usually forms the basic therapeutic measure as well as the preliminary one.

Bismuth.—It is a matter of individual preference whether mercury or bismuth is chosen. The method of action is the same, and bismuth injections are perhaps the easier to handle and prescribe.

Intraspinal Therapy.—The Swift-Ellis treatment has fallen almost into disuse in neurological clinics, but it is possible that there still exists an indication for intraspinal therapy as a last resource in the treatment of intractable cases of tabes, particularly when pain is a prominent symptom. Reese regards the existence of rapidly advancing meningeal involvement, with severe crises, optic atrophy, and raised intracranial pressure, as calling for intraspinal therapy. He also adds cases which prove intolerant to arsenic injections. The same author prefers the Gennerich method to that of Swift and Ellis, and advocates the following technique: If the spinal meninges are more or less acutely inflamed, 1.35 mgrm. of **Novarsenobillon** in 60 c.c. can be given twice a week. In metasypilis of the cord, never more than 0.3 to 0.5 mgrm. should be given in from 40 to 60 c.c. of spinal fluid at intervals of three weeks. To relieve subacute basilar meningeal symptoms, N.A.B. can be injected intracisternally in doses of 0.5 to 1.0 or 1.5 mgrm. The patient should rest in bed for at least thirty-six hours in the Trendelenburg position.

Arsenical Treatment.—In this country **Novarsenobillon** is perhaps the most popular arsenical preparation in the treatment of neurosyphilis; clinically, little or no advantage seems to follow the use of silver compounds of salvarsan. When intravenous medication is difficult, as in very young or obese subjects, intramuscular injections of **Sulfarsenol** may be employed. Reports are encouraging as to its use in the treatment of congenital neurosyphilis. Advanced cases of syphilis of the nervous parenchyma should receive arsenical treatment only with great caution, or not at all. Oppenheim is quoted as

stating towards the end of his life that 'a tabetic patient with a distinct tendency to progress is better off without vigorous antisyphilitic treatment'. In such the treatment should be carried out along non-specific lines.

Tryparsamide.—Neurologists are becoming more and more attracted to tryparsamide in the treatment of syphilitic affections, not only cerebral but also spinal. Both clinical and serological improvement may be striking when this drug is employed, and there is often a favourable change in the weight and general health of the patient. Tryparsamide is often successful where courses of N.A.B. have failed to do good; in fact, there is evidence to suggest that previous medication with N.A.B. enhances the effect of tryparsamide. An average weekly dose is 3 grm., but patients with severe lightning pains or visceral crises may require 4 or 5 grm. Iodides and mercury or bismuth should be prescribed at the same time. Tryparsamide treatment should follow a course of **Therapeutic Malaria**, with resultant improvement in the clinical state and more especially in the serological reactions. Malarial treatment may often advantageously be preceded by tryparsamide, especially when the patient's physical condition is dangerously debilitated. The well-known danger of tryparsamide lies in the possibility of damage to the optic nerve. Whether this is due to the direct action of the drug upon the nerve-fibre, or to the therapeutic stimulation of early interstitial and perioptical changes is not clear, but the problem is a most important one. As a matter of experience, subjective visual impairment may occur in 3 to 10 per cent of cases, where full doses are employed (Lees); this is, however, of temporary nature. Permanent amblyopia, due to optic atrophy, is said to occur in 1 per cent of cases. It is an important and debatable point whether tryparsamide therapy will precipitate or accelerate a commencing optic atrophy; if it does, then its value will be restricted in cases of tabes, but will remain for cases of G.P.I., where atrophy is rare. For the same reasons, tryparsamide might theoretically be dangerous in cases of inherited syphilis, where the optic nerve is often affected. Some physicians regard recognizable optic atrophy as a contra-indication to tryparsamide unless the patient is already blind, or there is some most pressing indication (J. E. Moore)⁶. The theoretical and practical arguments are open to serious objection, however.

Far more data are required before we can be sure whether the advantages of tryparsamide are outweighed by a possible menace to the optic nerve.

Malaria.—Non-specific measures are now established as among the more efficient methods of treating neurosyphilis. Despite the natural disappointment that succeeded the early optimism, malaria still offers the best chance for arsenic-resistant cases and particularly for G.P.I. The prognosis for institutional cases of general paresis has been fundamentally changed since the employment of the malarial treatment. There is a greater tendency nowadays towards its use in cases of neurosyphilis other than G.P.I.; in cases of tabes the benefit is less striking than in paresis, but the results compare well with those obtained from arsenic. Cases of tabes associated with severe pains or with commencing optic atrophy are especially suitable for malaria. It is widely believed that the very early cases of G.P.I.—in which psychical changes are slight or absent—react particularly well; there is some evidence to suggest that the best results are obtained by interrupting the malaria with quinine, and then, after an interval, instituting a second course. There is but a slender case to be made out for tryparsamide or arsenic versus malaria, and it seems agreed that malaria followed by tryparsamide is the treatment of choice. The effect upon the patient is produced more quickly and more efficiently by this combination than by tryparsamide alone, and it is believed that the danger of optic atrophy is much less.

Structural Effects of Malaria upon the Brain in G.P.I.—That malaria has a powerful action upon the cerebrum can be demonstrated histologically by comparing the microscopical appearances of paretic brains of cases treated and untreated with malaria. It is found that marked histological alterations are effected, which may be summarized by stating that the action is to transform the parenchymatous lesion into a granulomatous one. From the pathological studies of W. Freeman,⁷ A. Ferraro,⁸ R. B. Wilson,⁹ and R. Stern¹⁰ we may outline the cerebral effects of malaria as follows: (1) A transitory lymphocytic increase. (2) A transitory microglial reaction. (3) Possibly the disordered arrangement of the cortical cell-layers undergoes some improvement. This may perhaps be due to increased permeability of the blood-vessels. (4) Swelling of the endothelial lining of the blood-vessels. (5) A marked destruction of the spirochætes. The mechanism of this is obscure; they may be destroyed by the high fever, or possibly destroyed by the stimulated reticulo-endothelial system of the cerebrum. There still remains the possibility that the spirochætes are merely washed away from the brain substance by oedema. (6) Increased activity of the extraneural syphilitic processes, whereby patients under malarial treatment may suffer an exacerbation of cutaneous and visceral syphilitic phenomena. In this way gummata may appear upon the skin or mucous surfaces and syphilitic affections of the joints develop. (7) Finally, there is a recession in the inflammatory changes.

That an increased permeability occurs in the barrier between plasma and spinal fluid is well known and can easily be shown by such tests as Walther's. This in itself may have an important bearing on the value of combined malaria and trypanamide (or arsenic) therapy.

Jugular Compression.—D. C. Smith and J. A. Waddell¹¹ suggest the application of jugular compression in order to increase the effectiveness of intravenous antisymphilitic remedies. This procedure is carried out by means of an adjustable woven strap which is wrapped around the neck. A metal button, padded with leather, is placed over each jugular vein and pressure is made by tightening the strap; engorgement of the facial veins and pulsations of the temporal artery follow. The collar is tightened immediately after intravenous injection and maintained for thirty minutes. In a series of 22 cases in which jugular compression had followed intravenous injection of arsenic, the average content of arsenic in the cerebrospinal fluid measured 0.061, as opposed to 0.040 in the control series of 18 patients. This procedure is contra-indicated in cases of glaucoma, cerebral tumour, and cerebral hæmorrhage. In discussing this communication Osborne stated that the content of arsenic in the cerebrospinal fluid is not necessarily an index of the amount of arsenic in the brain or cord tissues.

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NEWBORN, BIRTH INJURIES IN. *Reginald Miller, M.D., F.R.C.P.*

G. B. Fleming¹ gives his experience on this subject based on his records at the Royal Maternity Hospital, Glasgow, over a period of three and a half years. During this time, in approximately 8000 infants born alive, there were 350 instances of more or less severe birth injuries. He quotes J. N. Cruickshank² as attributing about 80 per cent of neonatal deaths to birth injury; of these more than half succumb in the first three days of life. Fleming emphasizes the remarkable contrast between the recuperative powers of newborn infants from injury and from sepsis. Injuries, where not too severe, are rapidly

recovered from, but any form of added sepsis greatly increases the danger to the child. The classification of birth injuries is best given on an anatomical basis.

Skin and Subcutaneous Tissue.—Many injuries to these parts are very minor and heal rapidly. The caput succedaneum never gives rise to trouble. In face presentations the swelling of the mouth may interfere with sucking, and in breech cases with oedema and bruising of the genital organs there is considerable danger of sepsis from soiling of the damaged tissues by the excreta. Severe bruising of the scalp may give rise to sloughing and infection. The cephalhematoma rarely becomes infected. The subcutaneous tissues are sometimes damaged by pressure, producing the condition called 'adipo-necrosis neonatorum' by L. De Vel and Z. A. Bolin.³ These lesions consist in indurated swellings under the skin, dusky red in colour but not tender. They most commonly occur in the neck and upper part of the trunk, and take five or six weeks to disappear.

Bednar's ulcer, though hardly a birth injury, occurs so soon after birth that it may be included. It is an ulcer on the palate or pharynx resulting from the trauma due to attempts to remove mucus from the throat of a newborn baby. Usually it heals rapidly, but it is a possible portal of entry of infection.

Muscles.—The only injury to muscles of importance is that to the sternomastoid. It is almost always situated in the lower half of that muscle and may result in extensive fibrosis and wry-neck. It does not seem likely that simple rupture of the muscle should lead to such results, and it is probable that in such cases there is some venous obstruction and ischæmic contracture.

Bones.—The most common fracture is that of the skull. This occurs chiefly in vertex presentations, and most frequently involves the frontal bone. Surgical intervention should as a rule be avoided. The infant's skull is so elastic that depressions in the bones are unlikely to cause symptoms from increased intracranial pressure. The deeper injuries inside the skull are for the most part outside the scope of surgical aid, and it is only where there are definite signs of active mischief at the site of the fracture that operation should be undertaken. Fracture of the clavicle is of fairly common occurrence. As there is seldom much displacement of the bone, the condition may easily be overlooked or mistaken for Erb's paralysis. Fracture of the humerus or of the femur may also occur.

Viscera.—Injuries to the organs in the thorax (lungs) and in the abdomen (suprarenal, kidney, and liver) are not easily recognized during life. Hæmorrhage may occur in the retroperitoneal and perirenal tissues, and into the testes in breech presentations.

Nervous System.—Injuries to the peripheral nerves other than those of the face and brachial plexus are very rare. In the author's 66 cases of facial paralysis, 63 of the infants had been delivered by forceps. Recovery is the rule, usually within one or two weeks. Injuries to the brachial plexus are much more serious. Probably overstretching of the nerve-trunks is the most common cause of this trouble, though the causative factors are not yet altogether agreed upon. Two types of the brachial paralysis are recognized, although atypical cases may be found. In the Erb-Duchenne type the paralysis is due to the damage to the 5th and 6th cervical roots or the trunk formed by their union. The muscles most commonly affected are the deltoid, the supra- and infraspinatus, the teres minor, biceps, brachialis anticus, and supinator longus. The arm is internally rotated and held close to the side, the forearm is extended and pronated. Supination and flexion of the forearm are impossible, and the arm cannot be abducted or rotated outwards. In the Klumpke type, which is much less common, the injury involves the 7th and 8th cervical and 1st dorsal roots. The triceps and practically all the muscles of the forearm and the hand,

except the supinator longus, are paralysed. The forearm is flexed at the elbow and supinated, and the hand is flaccid.

Injuries to the spinal cord may occur in breech presentations. Those at a high level are necessarily fatal. Those at a lower level produce the signs of a transverse lesion of the cord. They are recognized with difficulty in the newborn infant.

Intracranial hæmorrhage is extremely common and a frequent cause of neonatal death or stillbirth. Gross intracranial hæmorrhage is found in 20 to 25 per cent. of such cases. It is particularly frequent in premature infants. The most common lesion is a tear in the tentorium, though damage to the falx cerebri, or to the tributary veins of the longitudinal sinus, or the veins of Galen may also give rise to bleeding, and hæmorrhage from the choroid plexus may fill the ventricles with blood. The diagnosis of intracranial hæmorrhage at this age during life is very difficult. The signs pointing to it are drowsiness, feeble cry, inability to suck, muscular rigidity, convulsions, bulging of the fontanelle, and intermittent attacks of cyanosis; but they are far from diagnostic. Bulging of the fontanelle is not very common, and the other signs mentioned may arise from various causes. A definitely pigmented or uniformly blood-stained cerebrospinal fluid with crenated red cells is probably the most important manifestation of intracranial hæmorrhage. Even this sign does not afford absolute proof, as possibly hæmorrhage or capillary oozing occurs in a large proportion of newborn babies, especially in premature infants. Treatment must be to a great extent symptomatic. The sequels consist of mental deficiency, asymmetrical spastic paralyses, and hydrocephalus. The true spastic diplegia of the ordinary type owns another cause.

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NEWBORN, HÆMORRHAGIC DISEASE OF.

Reginald Miller, M.D., F.R.C.P.

N. B. Capon¹ has studied a series of 28 cases which seem to him to be properly classed under the heading of hæmorrhagic disease of the newborn. As he says, not every newborn baby which bleeds is suffering from hæmorrhagic disease, and before such a diagnosis is made the following requirements must be satisfied: (1) Hæmophilia, asphyxia, and birth trauma, and spurious hæmorrhage due to the swallowing of maternal blood, must be excluded by the family and obstetrical histories; (2) Examination of the child must exclude secondary hæmorrhage, as that brought about, for example, by sepsis, syphilis, and gastro-enteritis; (3) The bleeding must begin within the first seven days of life; and (4) Spurious hæmorrhage from swallowing blood from a cracked nipple must be excluded.

The disease presents a clear-cut clinical syndrome characterized by the sudden onset of hæmorrhage generally between the first and fifth days of life, without obvious cause. The bleeding is generally external; melæna and hæmatemesis are the most common varieties, but sometimes the blood comes from the umbilicus (occasionally later than the seventh day), vagina, urethra, or mucous membranes. Internal hæmorrhage is less frequent. The author regards gross bleeding into the suprarenal glands, the peritoneal cavity, or under the capsule of the liver or spleen as generally of traumatic origin, though he thinks that with a greatly increased tendency towards bleeding, the trauma may be abnormally slight. He has excluded all such cases from his series. The disease is dramatic in onset and often dangerous, for loss of blood is badly borne at this age. Even a few ounces of blood should be regarded as a severe hæmorrhage in newly born infants.

ETIOLOGY.—Various hypotheses have been put forward to explain the hæmorrhagic disease, but none can be said to be entirely satisfactory. Nor is there much of note on the clinical side as offering any explanation of the disease, except that a large proportion of the cases (16 in Capon's 28 cases) occurs in first or second children. Apart from this, which is not in itself very illuminating, no other factor emerges. The age and health of the mother, the obstetrical history of the birth, the weight and maturity of the infant, the sort of anæsthetic used at the labour: none of these possible factors appears to be of moment. Capon has seen both children affected in the case of monovular twins, and only one child in an instance of binovular twins.

TREATMENT.—Injections of **Whole Blood**, given intramuscularly or subcutaneously, constitute the correct treatment. Given by these routes no preliminary grouping of the bloods is necessary. The injections may be made into the outer aspects of the thighs below the napkin area, into the deltoids, or abdominal wall. Injection into the superior longitudinal sinus is difficult and inadvisable. In a severe case 20 c.c. should be given at once, and 10 c.c. every two hours if the bleeding does not stop. Capon² has no objection to the use of citrated blood in this disease.

Apart from the injection of blood the baby should be kept strictly resting. Three hours after a hæmorrhage it may be given milk aspirated from the breast or given glucose by mouth: to starve a small infant is probably to stimulate peristalsis. The baby should not be moved for the purpose of being fed for twenty-four hours after a hæmorrhage.

REFERENCES.—¹*Lancet*, 1932, ii, 887; ²*Ibid.* 1027.

NEWBORN, JAUNDICE OF. (See JAUNDICE IN CHILDHOOD.)

NOSE AND NASAL SINUSES, AFFECTIONS OF. (See also FACE, NOSE, AND LIPS, STAPHYLOCOCCAL INFECTIONS OF.)

F. W. Wathlyn-Thomas, F.R.C.S.

Skiagrams in Disease of the Nasal Sinuses.—Graham Hodgson,¹ R. Mittermaier,³ and R. Graham Brown⁴ discuss this subject, the first two from the point of view of the radiologist, the third, in a paper which is confined to the antrum, from that of the surgeon. The technique described by the three writers varies in detail, but all are agreed on some important points. All agree on the importance of 'standard positions', and, as Hodgson points out, such positions must be 'standard' for an axis of the skull to the plane of the film; they must not depend on the facial contour. All agree that skiagrams of the sinuses should be taken in the erect, not the prone, position. Further, all are opposed to the injection of iodized oil as a routine aid in radiological diagnosis, because, although it may be useful in exceptional cases (e.g., the detection of a 'double' or septate antrum), it actually obscures the very changes in the lining membrane which it is intended to demonstrate.

Mittermaier does not regard oblique views as valuable, but Hodgson uses them as a routine for examination of the posterior ethmoids. Mittermaier, although he upholds 'standard positions', adds that these should be supplemented by exposures in any direction that may be necessary. Graham Brown speaks highly of the value of stereograms, but reminds us how few of us have really adequate stereoscopic vision.

Further points of interest are the demonstration of 'pus bags' (loculated cystic collections in the antrum) by Graham Brown, and Hodgson's demonstration, by a tilting method, of the fluid level when pus is present to a moderate extent. One of Graham Brown's photographs shows that in empyema of the antrum the cavity may be so full that no fluid level is seen.

These papers show the great advances which have been made in the radiology of the accessory sinuses in the last few years, and should be an incitement to a general improvement in a rather neglected field.

The important work of A. W. Proertz⁵ should be mentioned in this connection. His method of 'displacement' depends primarily on Mariotte's Law that the tension of a gas is inversely proportional to its volume. Thus by closing one nostril and connecting the other to a suction chamber the tension of air in the sinuses will be reduced. If the main cavity of the nostril be so filled with fluid as to submerge the orifices of the sinuses opening into the cavity, when the main cavity is aspirated the tension in the communicating cavities will be lowered and the fluid will enter them. Strictly speaking perhaps we should call it a method of 'replacement', because air is replaced by the filling fluid. This method can be used either for diagnosis, as a help to radiography by filling the cells with some radio-opaque fluid, or as a means of treatment, by filling the cells with various medicaments.

As a means of treatment the method would certainly be useful in some cases of chronic sinusitis where surgical treatment was inadvisable, but the writer's own deductions show that even here its use is limited. For one thing, he regards the non-entry of opaque fluid into a sinus as the proof of disease and of an obstructed ostium; for another, he regards retention of the fluid as a proof of disease. Without accepting either generalization as the complete truth, it is clear that in sinus disease the medicating fluid might either fail to get in, or, having got in, be unable to get out. There is also the possibility of fluid entering the Eustachian tube. No such case has yet been heard of, but, when we remember that even in syringing a nose such an accident has happened, it is a possibility to be remembered. The method may be of great value, but it must be used with discretion. As a means of diagnosis there are objections. All the writers whose works have just been discussed are sceptical of the value of radio-opaques as a means of diagnosis, and Hodgson,⁶ dealing with Proertz's views, found that in an experimental series of forty normal medical students it was only in a small percentage that the entire ethmoid labyrinth was filled, and that failure was most marked in the posterior ethmoid, unfortunately the very region where success would be most valuable to the surgeon.

Fractures of the Nose and Sinuses.—As E. Watson-Williams⁷ points out, there is a tendency for everybody except the victim to regard a broken nose as somewhat humorous. This is particularly unfortunate, because, apart from the visible deformity, the internal deformity may cause serious interference with nasal function. This is emphasized by H. A. Seigall and M. M. Mancoll,⁸ who further suggest that neglected nasal injuries in childhood may be a predisposing cause of atrophic rhinitis in later life.

Every fracture of the nose is a compound fracture internally, as the torn mucosa of the septum exposes the fracture-line, and sometimes externally as well. When the accessory sinuses are involved in the fracture there may be emphysema, filling of the sinus with blood, and secondary infection. If the frontal sinus is fractured there may be an accompanying fracture of the base. The question of fracture of the sinuses was discussed in the last number of the MEDICAL ANNUAL (p. 316). Since then E. S. Gurdjian and H. K. Shawan⁹ have reported on 125 cases of frontal-sinus fracture occurring in 2600 fractures of the skull. In most of these (71 cases) there was no bleeding from the nose; in only two was there any cerebrospinal rhinorrhœa. It seems from the account given that fractures of the nose itself are much more rare in frontal-sinus fractures than in maxilla and antrum fractures.

TREATMENT.—For the treatment of nasal fractures themselves Watson-Williams, Seigall, and A. Sargnon¹⁰ are all agreed that the fracture should be reduced soon after the accident. Sargnon remarks that 'relative union' takes place in ten days. Seigall and Mancoll advise 'immediate' reduction under

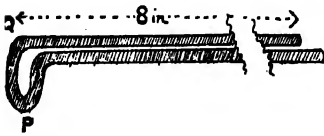


Fig. 49.—Bends P and Q.



Fig. 50.—Bend R, right side only.

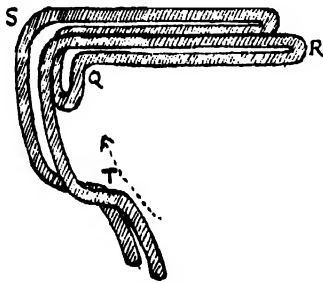


Fig. 51.—The splint ready for insertion.

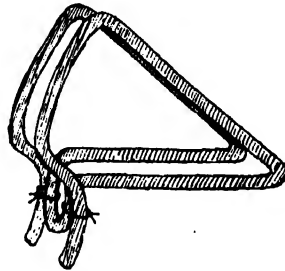


Fig. 52.—The splint expanded and tied.

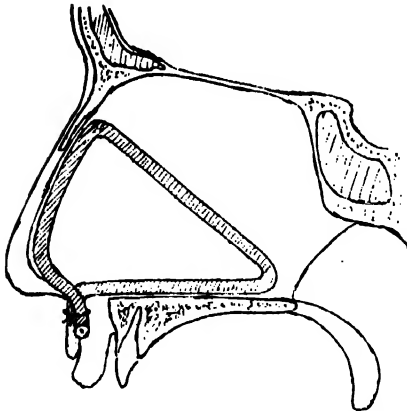


Fig. 53.—Section through left nasal chamber, showing position of splint.

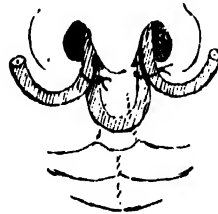


Fig. 54.—upper lip with splint in position.

Figs. 49-54.—E. Watson-William's Self-retaining Nasal Splint. Stout silver wire, cased in rubber tubing, is first bent to a 'V' shape at P. The end P is then bent at Q to a right-angle. Each limb is then doubled over on itself at R, 2 in. from Q, and finally bent as shown at S and T. (By kind permission of the 'British Medical Journal'.)

general anæsthesia. They believe that, once the fracture is reduced, alignment of the fragments is absolute, and that they remain in position. Sometimes some support is needed, and they then use a well-oiled pack or a rigid septal splint; when external support is needed they give it by rolls of gauze strapped to the nose on either side, or by a 'cast' of dental compound. Sargnon

also effects reduction as soon as possible. He prefers to do so with local anæsthesia, and uses a retaining apparatus for all fractures of moderate or severe degree.

Watson-Williams, although he too believes in early treatment, points out that it is impossible to estimate the damage properly until the swelling has gone down. Immediate local treatment should be confined to suture of lacerations, etc. In from four to eight days further treatment may be carried out. He points out that there is a fracture-dislocation with rotation of the fragments, and sums up the resultant positions thus :—

1. On the side from which the blow fell, an inward displacement towards the mid-line of the fragment (usually the lower two-thirds of the nasal bone, and often the anterior margin of the maxillary frontal process), with little backward displacement.

2. On the opposite side, an outward displacement with rotation.

3. In the mid-line, the first fragment is driven under the second, thus giving an 'imbrication-impaction'.

Reduction is done under general anæsthesia, with a post-nasal sponge in position. The only instrument used is a pair of forceps with blades about $2\frac{1}{2}$ in. long, slightly bowed so that only the tips meet. These are well padded with strapping. The essential point is the disimpaction of the fragments, so the first movement is to take the fragment on the convexity, that is the side to which the nose is bent, and rotate it still further outwards. Next the other fragment is also turned outwards, so that a gap can be felt between the two fragments. The septum can then be straightened with the forceps and the two fragments pushed together between the fingers and 'locked'. In the majority of cases no further treatment will be needed, but for the most severe the writer has devised a most ingenious and simple internal wire splint which is shown in the accompanying illustrations (*Figs. 49-54*). The advantage of this splint is that it does not completely block the airway and is easily put in and taken out. By using the splint it should be possible to avoid any form of external apparatus. Where a portion of the maxilla is driven into the antrum, reduction by the canine fossa route is advised. Probably on the whole the method described in last year's ANNUAL (insertion of a sound into the antrum through the nose) is preferable. Where the nose is split, immediate and accurate suture is advised;² a nasal splint should be used to prevent adhesions between the septum and the nasal wall.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1931, 1579; ²*Brit. Jour. Radiol.* 1931, Sept., 421; ³*Jour. Laryngol.* 1931, xvi, 661; ⁴*Ibid.* 470; ⁵*The Displacement Method of Sinus Diagnosis and Treatment*, St. Louis, Annals Publishing Co., 1931; ⁶*Jour. Laryngol.* 1932, xlvii, 650; ⁷*Brit. Med. Jour.* 1931, ii, 791; ⁸*Med. Jour. and Record*, 1931, Oct. 7, 328; ⁹*Ann. of Surg.* 1932, Jan., 27; ¹⁰*Rev. Chir. plastique*, 1931, July, 111.

OBESITY.

W. Langdon Brown, M.D., F.R.C.P.

E. P. Poulton¹ protests against the practice of merely giving the weight of alleged obese subjects without adding any dimensions by which it can be gathered whether they are really too fat or not. He calls attention to the fact that if the glandular and muscular apparatus remain the same size in the obese as in the normal individual they must work harder to maintain a normal basal metabolic rate (as is so often found) because there is an increased body surface. This often means increased activity on the part of the thyroid, which may become exhausted, leading to a secondary hypothyroidism. He considers that there is much to be said in favour of hyperinsulinism as a cause of obesity. The taking of sugar is not only fattening in itself, but stimulates the pancreas to secrete more insulin.

In 'pituitary obesity' both glycogen and fat are increased in the liver,

whereas in diabetes they vary inversely. As the secretion of insulin can be stimulated from centres in the brain it is possible that in pituitary, or more correctly hypothalamic, obesity the obesity results from a reflex increase of insulin thus produced. [But it must be remembered that J. H. Burn has shown a direct chemical antagonism between pituitrin and insulin. In hypopituitarism, therefore, insulin would tend to predominate and thus a relative hyperinsulinism would result, leading to obesity.—W. L. B.] In the discussion which followed W. W. Payne made the interesting suggestion that as in some obese subjects it was found by Nissler and others² that hypoglycæmic symptoms started at a higher level of blood sugar than normal, attempts to control their weight by diet would lead to such a lowering of blood sugar as would compel them to eat more. This would account for the great difficulty in reducing the weight of some patients by dieting. They become ill before much reduction can be effected. (*See also INSULIN AND NON-DIABETIC STATES.*)

F. A. Evans and J. M. Strang³ maintain that only about 2 per cent of obese subjects fail to respond to **Dieting**. They give a diet of 1 grm. of protein and 0.6 grm. of carbohydrate per kilo and no fat other than that inseparable from the protein ration, and claim that no disagreeable symptoms supervene.

Y. Kermorgant⁴ considers that a raised basal metabolic rate in an obese subject suggests gross feeding or ovarian disturbance. [I have recorded raised B.M.R. in the obesity of virilism.—W. L. B.]

According to D. M. Dunlop and D. Murray Lyon,⁵ although there are clear instances of exogenous obesity due to overeating and indolence, and of endogenous obesity showing typical stigmata of deficient pituitary, thyroid, or ovarian function, the great majority of cases of obesity lie in between these two extremes and are hardly capable of classification into one or other type. In a study of 523 cases they found just over half were of a mixed type. The importance of heredity was shown by the fact that just upon 70 per cent had overweight fathers or mothers. Excessive carbohydrate intake appeared to play a part in 45 per cent. **Thyroid** extract was no substitute for diet, though it might be auxiliary to it. They obtained an average loss in outpatients of 1.9 lb. per week by dietetic treatment alone. Long-continued obesity was not found to be a drawback to successful treatment, but the greater the original excess weight, the greater the tendency to relapse after discontinuing treatment.

D. M. Lyon and D. M. Dunlop⁶ find that 9 gr. of thyroid daily are required to produce as much loss of weight as a standard diet of 1000 calories.

L. H. Newbough⁷ maintains that statistics prove that the basal metabolic rate of obese persons per square metre of their body surface is normal, and that progressive retention of water in the tissues during treatment may conceal the loss of weight caused by destruction of tissue. Like Dunlop and Murray Lyon, he is of opinion that many obese individuals, so far from being phlegmatic as ordinarily supposed, are nervous and emotional, and he quotes Mary Harrington as to the habit of some of obtaining relief during periods of nervous stress by repeated nibbling of food.

M. G. Wohl,⁸ quoting Du Bois' remark that the real problem is why all individuals in this overnourished community do not grow fat, considers hypothyroidism is a comparatively infrequent cause. He calls attention to disturbances of water and salt metabolism as a factor, and finds that in some cases **Salyrgan** is a useful addition to diet and restriction of water and salt.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1932, Jan., 347; ²*N. Y. State Jour. Med.*, 1931, July 15, 187; ³*Jour. Amer. Med. Assoc.* 1931, Oct. 10, 1063; ⁴*Presse méd.* 1931, Aug. 29, 1232; ⁵*Edin. Med. Jour.* 1931, Oct., 561; ⁶*Quart. Jour. Med.* 1932, April, 331; ⁷*Jour. Amer. Med. Assoc.* 1931, Dec. 5, 1659; ⁸*Amer. Jour. Med. Sci.* 1932, May, 613.

OBSTETRICS AND RADIOLOGY. *Beckwith Whitehouse, M.S., F.C.O.G.*

The increasing value of radiography as an aid to antenatal diagnosis is emphasized in a communication by R. E. Roberts¹ based upon the examination of 600 cases. In the first place X rays may be used in the positive *diagnosis of pregnancy* from the sixteenth week onwards, and sometimes earlier. They are also of value in the differential diagnosis of pregnancy from *hydatidiform mole* and *tumours of pelvic origin*, at any time after the sixteenth week of gestation. Very exact radiological measurements of the diameters of the *pelvic brim* and *outlet* are now possible, and in this way both major and minor pelvic deformities can be detected.² Cases arise not infrequently where a discrepancy is apparent between the alleged period of amenorrhœa and the clinical size of the uterus. Radiology is useful on such occasions in *defining the actual age of the fetus*.¹ The demonstration of *disproportion* between the foetal head and the pelvic brim, and the precise determination of the *position and presentation of the fetus* when clinical uncertainty exists, are further instances where radiological diagnosis is valuable. *Deflexion* of the head in 'vertex' presentations and *extension of the limbs* in 'breech' cases are examples in point. It is interesting to note that in 100 'breech' presentations, in most of which external version had been attempted and failed, Roberts found extension of the legs in 76. In cases of *hydramnios* investigated radiologically by the author antenatal diagnosis of *fœtal abnormalities* was made on 28 occasions (anencephalus 17, hydrocephalus 6, iniencephalus 3, meningocele 1, rudimentary limbs 1). Finally, a radiograph is of value in assisting in the diagnosis of *intra-uterine death of the fetus*. In the dead fetus the cranial bones overlap (*Spalding's sign*), a diagnostic sign which is clearly demonstrated on a good photographic plate.

Roberts observes that there is no evidence that diagnostic antenatal radiography when efficiently carried out is ever detrimental to either the mother or child. To obtain his results the author employed a Snook transformer, a hot-cathode tube, and a Potter-Bucky couch compressor band. The voltage used was of 80 to 100 K.V. peak and an exposure given of 70 to 350 milliamperes-seconds at a film target distance of 30 inches.

REFERENCES.—¹*Jour. Obst. and Gynaecol. Brit. Emp.* 1932, No. 3, xxxix, 710; ²*Brit. Jour. Radiol.*, 1927, Jan.; 1931, Sept.

OCCUPATIONAL SKIN DISEASES. (*See DERMATITIS VENENATA; NAILS, DISEASES OF.*)**ŒSOPHAGUS, DISEASES OF.**

F. W. Wathlyn-Thomas, F.R.C.S.

CARCINOMA.

TREATMENT.—The treatment of carcinoma of the œsophagus is discussed by Musgrave Woodman,¹ who remarks that the greatest difficulties in treatment are the structure and the relations of the organ. It is in close contact with the trachea and left bronchus, the pleura embraces it, the vagi pass along it, and there is no peritoneal coat to assist the surgeon. Woodman's own experiments on the lymphatics show that lymphatic spread in early stages is probably slow, but once the surrounding reticulum of vessels is passed the advance is wide and swift.

Diathermy has been tried, but the results are disappointing. It was hoped that by repeated and cautious use of diathermy a protective reaction of the surrounding connective tissue would accompany the destruction of the growth and diminish the risks of perforation. Unfortunately this did not occur, and Woodman, in a series of experiments on animals, was unable to cause any such

reaction by irritants injected into or through the wall. As a palliative measure diathermy is valuable, but not free from danger; as a cure it has failed.

Radium.—In the author's hands the *external application* of radium has not been successful. In his opinion, if by any method the growth can be reached through the neck, surgical excision is better. Attempts have been made to plant radium around the growth in the thorax, but this, too, has been a failure. The route is by a transcostal thoracotomy, an operation usually too severe for patients already weakened by a carcinoma of the œsophagus, and the three patients so treated all died within a month of the operation.

Central application of radium, which is done by inserting into the lumen of the œsophagus a tube to the outer surface of which radium needles are fixed, has two great disadvantages: (1) The radium increases the sepsis on the ulcerating surface; (2) The radium acts on the most degenerated and central part, which is furthest from the growing edge.

Interstitial application of radon, by a technique described by Woodman four years ago, seems the method of choice. The seeds are buried deeply in the upper part of the growth, and their position is checked by a series of X-rays. The objection is that the growth must be treated piecemeal, but in two cases there has been apparent complete disappearance of the growth.

Gastrotomy Woodman regards as a confession of failure. It may sometimes be necessary, but he has never known a case where the patient was grateful for the operation or where it rendered endo-œsophageal treatment more easy.

IDIOPATHIC DILATATION.

F. A. C. Seringer,² under the heading "idiopathic dilatation of the œsophagus", describes, principally from the surgical aspect, the condition variously known as 'cardiospasm', 'phrenospasm', 'achalasia', etc. He defines it as a "considerable dilatation of the organ without an anatomical stenosis, but associated with difficulty in the passage of food into the stomach". Seringer regards it as the most common disease of the œsophagus except cancer.

It is almost certain that several different pathological conditions are included in the one clinical statement; for example, in some cases the œsophagus fills 'like a bag'; in others, much more rare, there is violent peristalsis. The pathological appearances are especially (a) dilatation and (b) elongation, which is followed by bending. In the dilated portion the wall may be normal, thinner than normal, or, rarely, thickened. The subdiaphragmatic portion is contracted and narrowed in 50 per cent of post-mortem cases, but hypertrophy of the muscle is rare.

There are two views as to the cause: (1) Spasm of the cardia with secondary dilatation; or (2) Failure to open (achalasia). Against the 'spasm' view, no mechanical stricture ever produces such enormous expansion; there is no more serious opposition to the passage of a sound than would be found in the tonic closure of the unopposed circular fibres; there is rarely any hypertrophy of the sphincter. 'Failure to open' might be caused by failure of the vagus path and this would be accompanied by atony of the œsophagus. But in animals, when the vagi are cut, although there is dilatation of the œsophagus and closure of the cardia, there are such general disturbances that the animal soon dies. It is probable, therefore, that some failure in the vagus control is responsible, but the vagal injury cannot be in the nerve trunk; it is probably in Auerbach's plexus, where the vagal endings to the œsophagus and cardia ramify and connect with the sympathetic. This opinion is confirmed by Rake, who, in the last five years, has examined a series of cases post mortem, and has found degeneration of Auerbach's plexus in every one.

TREATMENT.—This has usually followed two main lines: (1) Dilatation from above by bougies or the hydrostatic bag, or from below by gastrostomy and finger-stretching of the sphincter; (2) Some attempt at radical cure—either anastomosis between the fundus of the stomach and the dilated part of the œsophagus, 'short circuiting' the cardia (Bull); or division of the sphincter muscle, very much like Ramnstedt's operation for infantile pyloric stenosis (Heller). Scrimger objects to both these operations. Bull's operation depends on suturing the œsophagus, always dangerous because of the weakness of the wall; and in Heller's operation it may be found that the mucosa is defective. Scrimger himself had one such case, and the patient died of mediastinitis.

Moreover Scrimger believes that the essential factor in success is abolishing the kink which the weight of food causes in the elongated œsophagus, and by so doing letting the swallowed food make direct pressure on the cardia. To achieve this he enlarges the diaphragmatic hiatus by dividing the crura and then straightens the œsophagus by pulling it down and stitching the dilated part to the edges of the enlarged diaphragmatic opening. So far only 3 cases have been done, but his results have been very good.

TRAUMATIC STRICTURE.

Jean Guisez³ describes in detail his method of treating traumatic strictures of the œsophagus by **Electrolysis**. He has now treated 16 patients, 6 of them children under five years old, and all results have been good.

Guisez states that unless the stricture is cured the condition is always fatal; even gastrostomy gives only temporary relief. He also points out (1) that these strictures are usually multiple, (2) that after simple dilatation they usually recontract; it is for this reason that he uses electrolysis. His method is to start with bougies that screw on to each other, so that the first bougie need not be withdrawn. A filiform bougie is passed under direct vision with an œsophagoscope, and left in position for four or five hours. This causes absorption of the fibrous tissue, and larger bougies can then be passed. No attempt should be made to force the lower stricture until the œsophagoscope can be passed through the upper one. Electrolysis is carried out by passing a 'railway' instrument down the œsophagoscope and over the bougie. This has an olive-shaped nickel end; the rest is insulated. The olive is passed down to the face of the stricture, and care must be taken not to short circuit the current by touching the tube of the endoscope. The olive is the negative terminal of the current, a metal plate on the patient's chest is the positive, and the current used is 12 to 15 ma. This is kept up until the olive passes. The treatment is continued at weekly intervals until the full lumen is restored.

Acute Œsophagitis following the Swallowing of Caustic Fluids.—This appears to be the most popular method of suicide in Hungary and the Balkan countries. The usual chemical is caustic soda. In S. Bélinoff's⁴ cases the immediate death-rate was 30 per cent, with a further 13 per cent for late complications. Bélinoff finds four stages in surviving patients—a stage of necrosis, a stage of ulceration, then granulation, and, lastly, cicatrization and contraction. During the first two periods, although he inspects with the œsophagoscope, he makes no attempt at dilatation for fear of injuring the œsophageal wall, but contents himself with filling the œsophagus to distension with olive oil administered by a special syringe. When granulations appear, bougies are passed, first through an œsophagoscope and later by touch.

REFERENCES.—¹*Brit. Med. Jour.* 1931, ii, 290; ²*Ann. of Surg.* 1931, xciv, 801; ³*Rev. Laryngol.* 1931, June 15, 377; ⁴*Ibid.* 1932, Feb., 168.

OSSIFICATION, DISEASES DUE TO ERRORS OF.

John Fraser, Ch.M., F.R.C.S.Ed.

A vast amount of interest attaches to those clinical conditions which are associated with disturbance of the natural process of ossification. Some of the most problematical of these errors are encountered in childhood, and it seems appropriate to review certain of the more recent articles which make allusion to the subject.

Hypophysial Dysostosis.—This condition, sometimes garbed in the names of Schüller's disease and Christian's syndrome, is one of the most serious disturbances of the group. It is distinguished by five characteristics: a lacunar osteoporosis of the skull vault, exophthalmos, diabetes insipidus, dwarfism, and an infantilism associated with pituitary disturbance. The disease is rare, only three cases having hitherto been recorded. The last of these is described by J. Moreau,¹ upon whose paper this review is based. The condition is essentially a disease of childhood, virtually all the cases having occurred in a period between 2½ and 10 years, and boys are more liable than girls in a proportion of 8 to 1. At birth the child appears to be healthy, and the first evidence of disease is a process of decalcification of the skull bones, at first in isolated patches, but afterwards involving the entire skull vault. An arrest of body growth is the next disturbance to appear, and this is followed by the signs of an adiposogenital dystrophy, exophthalmos, and general weakness. Diabetes insipidus may appear at any phase in the progress of the disease. There are two forms, one acute, rapidly progressive, and invariably fatal; the other chronic in its manifestations and sometimes ending in recovery.

The only line of treatment which appears to afford prospect of benefit is **X-ray Irradiation** over a long period of time, and Moreau suggests that a **Diet** calculated to correct the hypercholesterinæmia should be arranged. Additional lines of treatment are the administration of **Insulin, Pituitary and Thyroid Extracts.**

Osteogenesis Imperfecta.—This is the subject of a paper by W. G. Turner and N. W. McLellan.² They record four cases occurring in a family of six children, the various ages being 7, 6, 3½, and 2 years. The father and mother were blood relations; the father was a healthy and vigorous woodman, the mother a frail creature who suffered from poor health during the period of her repeated pregnancies. The father had blue sclerotics, but there was no history of any bone error. The children were the victims of multiple fractures, one, aged 3½ years, showing seventeen fractures of the bones of the extremities (*Plate XXXIII*). All had blue sclerotics, and it was significant that three of the children had suffered from severe gastro-intestinal disturbance prior to the development of the bone error. The laboratory investigations indicated a similarity of findings in each case—a negative Wassermann; blood-sugar, blood-calcium, and blood-phosphorus normal; a secondary anæmia was evident.

The conjunction of blue sclerotics and bone disturbance is referred to by G. H. Stevenson and D. P. Cuthbertson.³ They refer to the interesting association which there is between blue sclerotics, brittle bones, and otosclerosis with deafness, and they recall the views of Bauer and others, who hold that the combination of errors arises from a common source, a congenital mesenchymal defect, since all the structures involved in the syndrome come originally from this anlage.

The authors are inclined to be pessimistic about the question of treatment. It has been their experience that *osteogenesis imperfecta* is not benefited by any of the agents which have proved themselves to be specific in rickets; it is clear, for example, that ergosterol and cod-liver oil appear to have no specific effect upon the abnormality.

PLATE XXXIII

OSTEOGENESIS IMPERFECTA

(W. G. TURNER AND N. W. McLELLAN)



A child, aged $3\frac{1}{2}$ years, the victim of osteogenesis imperfecta, showing seventeen fractures.

*By kind permission of the
'Canadian Medical Association Journal'*

Myositis Ossificans Progressiva (or fibrositis ossificans progressiva, to give it a more correct title) is the subject of an interesting communication by W. F. Mair.⁴ He describes personal experience of two cases, a boy of 4 years and a girl of 4½ years, while he reviews at some length a number of cases previously recorded in literature. The pathology is described as arising in the connective tissue lying between the fibres of voluntary muscle, and the process visualized is a replacement of the interstitial connective tissue by a cellular embryonic structure which organizes to form a cartilaginous ground substance, which in its turn becomes the seat of a true bone formation. In the course of the process the related muscle fibres become atrophied, compressed, and ultimately disappear. The affection attacks voluntary muscle with the exception of the heart and diaphragm, the larynx, the tongue, and the sphincters.

The clinical aspects of the disease are fully discussed, including the characteristics and distribution of the tumours, the association of such congenital abnormalities as microdactylia, and the progress of the disease (*Plate XXXIV*). A particularly helpful section deals with the question of differential diagnosis, and special reference is made to the condition of calcinosis interstitialis multiplex ossificans, so similar to and so often confused with myositis ossificans progressiva.

The problem of treatment is dealt with in a fair and guarded manner, a special warning being uttered against surgical interference for the reason that it seems to stimulate the progress of the disease. No therapeutic measures of a really curative type have been discovered, and for the present all that can be done is to maintain the nutrition of the parts as far as is possible by gentle **Bathing and Massage**, and to keep the general standard of body health at as high a level as possible.

It is evident that the current of opinion tends to pass into a channel which recognizes an element of similarity between such apparently divergent conditions as osteogenesis imperfecta and myositis ossificans progressiva, the common factor being a congenital disturbance of the mesenchyme, the varying element a disturbance of calcium metabolism: in the one instance there is an imperfect calcium deposit in normal situations, in the other there is a deposit of calcium where it has no business to be. While we may recognize the significance of a predisposing error in the mesenchyme anlage, no explanation has yet been offered of the factors which control and vary the behaviour of the calcium.

REFERENCES.—¹*Arch. franco-belges de Chir.* 1930, xii, 697; ²*Canad. Med. Assoc. Jour.* 1932, June, 659; ³*Lancet*, 1931, ii, 782; ⁴*Edin. Med. Jour.* 1932, Jan., 13.

OSTEITIS DEFORMANS. (*See PARATHYROID GLANDS, DISORDERS OF.*)

OSTEITIS FIBROSA. (*See PARATHYROID GLANDS, DISORDERS OF.*)

OSTEOGENESIS IMPERFECTA. (*See OSSIFICATION, ERRORS OF.*)

OSTEOMYELITIS.

E. W. Hey Groves, M.S., F.R.C.S.

The treatment of osteomyelitis continues to afford much subject for discussion. This centres round two principle topics—namely, the routine treatment of early cases, and the value of the newer methods of treatment, that associated with the name of Winnett Orr and that by living fly larvæ. At a recent discussion¹ at the Royal Society of Medicine introduced by Gwynne Williams the former topic was chiefly considered. Williams founded his observations on 91 cases of acute osteomyelitis which have occurred at University College Hospital within the last twenty years. In these there were

18 deaths, 10 being within four days of the onset and attributable probably to septicæmia. The remainder occurred from ten days onward, and represent pyæmic conditions, in which the heart and lungs were infected by metastatic spread of the disease.

It is of great interest to review the subject of osteomyelitis and its treatment as it has varied during the past generation. In the first place it seems certain that the disease is much less common than it used to be, so that in an ordinary general hospital no one surgeon sees more than a few cases each year, and for this reason it is difficult to accumulate personal experience of the comparative value of different methods of treatment. Thirty years ago a distinction was made between acute periostitis and acute osteomyelitis. Treatment in those days was usually delayed until the definite appearance of an abscess. Since then it has been established that the origin of the disease is always in the metaphysis close to the epiphyseal cartilage, and it is a matter of chance whether the spread be chiefly outwards towards the periosteum or inwards towards the marrow cavity. Corresponding to this change in the idea of the focus of origin of the disease has been an altered practice in the time of operation. Now it is accepted that the disease should be attacked early, long before the formation of a large abscess, necrosis, or an involucrum. The diagnosis is made in reference to constitutional symptoms, high fever, localized pain with a point of exquisite tenderness over the metaphysis concerned. But this change of practice, although it has been of great value in the saving of life and limb, has brought with it new difficulties. When the inflamed metaphysis is exposed within a few days of the onset of the infection, the periosteum is found raised by pus and the bone beneath acutely inflamed, and the question arises how much should be done to open up the focus of disease. The natural idea was to make a wide exposure of the cancellous tissue of the metaphysis by means of a gutter or trough going right up into the adjacent marrow cavity; and this has been the general practice for many years past. But though life and limb have been saved, the cure of the disease has been slow and uncertain. It has been borne in upon us by the lapse of time and the failure to effect a definite cure that this method of treatment only arrests the disease without curing it. Thus many cases are left either with persistent sinuses or with a liability to a recurrence of the disease, either locally or in some other bone.

Starr, of Toronto, was chief among those who considered this problem, and suggested that the extensive guttering was unnecessary and harmful because it inevitably led to a further infection of parts of the bone which were not originally infected. He advocated a simple drilling of a few holes into the inflamed part of the bone which would serve to relieve tension and prevent massive necrosis. On the whole his suggestions have been received with favour, as is seen in the discussion at the Royal Society of Medicine.

If to this rather conservative idea of the limited opening of the bone tissues be added the method of wound treatment suggested by Winnett Orr, we have probably reached the best technique known to us at present. The **Orr Treatment** in brief consists in wide exposure of the infected tissues, removal of dead or diseased structures, cleansing with iodine and spirit, packing with vaseline gauze, leaving the wound widely open, fixing the limb in a plaster cast in which there is no window, and allowing the whole part to remain undisturbed for several weeks. A moment's reflection will show that there is the same underlying principle in both Starr's and Orr's methods. In the one, the only attack made upon the diseased bone is to drill it, so that tension may be relieved and an exit given for pus; in the other, wide drainage and free exit for discharges are provided, but otherwise the tissues are allowed and encouraged to work

out their own salvation. There can be no doubt of the wide acceptance of Orr's teaching and practice, and we can most heartily acclaim it as being the most practical advance in the treatment of septic bones that we have known for many years. J. Kulowski² reviews 155 cases treated by this method and he lays emphasis on the great saving of pain to the patient and to the shortening of the patient's stay in hospital, as well as to the improvement in the functional end-results.

Winnett Orr himself³ pleads that his method should be used not only for long-bone infections but also for those of the pelvis. He gives an analysis of 29 cases of infected fracture and osteomyelitis of the pelvis treated by himself and his assistants, with 86 per cent of good results. This compares very favourably with the other recent series by other surgeons using the older methods of a simple binder or weight traction, in which with one series of 31 cases only 45 per cent gave good results and in the other of 51 cases only 47 per cent. He exposes the infected bone, removes loose and dead fragments, and in osteomyelitis of the ilium cuts away the infected part of the crest. The wound is then packed with gauze according to his usual technique. The patient is placed on a fracture table, and by traction and manipulation the displacement is fully corrected. The legs and pelvis are fixed in a double spica plaster cast provided with a cross-strut between the legs, which helps in moving the patient afterwards.

A. Rendle Short⁴ draws attention to the importance of osteomyelitis of the ilium, illustrating his remarks by reference to two cases. In one, a boy of 14, pyæmia developed, with infection of the hip- and knee-joints, and recovery took place after an intravenous injection of **Mercurochrome**. In the other, a woman of 23, secondary infection took place in the pleura and pericardium, and death resulted.

The use of **Maggots** for the treatment of septic bone cavities was described in the *MEDICAL ANNUAL* for 1932 (p. 335). It has been accorded the reception which such a startling proposal was sure to receive in America. H. I. Goldstein⁵ speaks favourably of the method and states that the difficulty of breeding 'sterile' (i.e., bacteria-free) maggots has been dealt with by certain research laboratories, so that sterile live maggots can be obtained at once in America when needed. S. K. Livingston and L. H. Prince⁶ have followed up the maggot method and developed some new ideas in the course of their work. They noticed that when first introduced into wounds the maggots live and flourish for four or five days, but that each new batch introduced lives for a shorter period. They deduce the theory that some active principle is developed in the wound, inimical to the maggots and favourable to healing, and they think that the action of the maggot is therefore more complicated and more potent than a mere mechanical scavenging. They claim to have been able to extract from the bodies of the maggots an active curative agent, which can be introduced in solution into the wound and also used for situations (e.g., old mastoid wounds) where live maggots would be impossible. They report 100 cases with 90 per cent cures. These were mostly old tuberculous and pyogenic sinuses and cavities in adults. The treatment is in three stages: (1) Removal of all sequestra and wide opening of the wound; (2) Introduction of maggots every three to five days; and (3) Packing the wound with the 'active principle' of the maggots whilst giving bacterial vaccines.

[We confess to the great interest of these observations but also to a feeling of some scepticism as to the practical value of the method, and when we read of septic compound fractures in which the broken bone is first plated and the wound then sown with maggots we protest that zeal has outrun discretion. —E. W. H. G.]

The fact that osteomyelitis frequently leads to uncured or incurable sinuses has already been referred to. An interesting paper by E. B. Benedict⁷ emphasizes this and points out another untoward development in these very chronic cases. This is the growth of malignant disease. He has collected no fewer than 12 personal observations of the formation of cancer in old cases of osteomyelitis. Nearly all were males, 8 in the tibia, 1 in the femur, and 3 in the tarsus. Most of the cases had had a discharging sinus for more than thirty years! Usually a cauliflower growth at the mouth of the sinus gives an indication of the occurrence of the neoplasm, but in some cases this has only been discovered by examination of tissue scraped from the interior of the sinus. The growth is always an epithelioma. The treatment in 9 cases was **Amputation** and in the remainder **Local Excision**. The prognosis after this treatment is good.

REFERENCES.—¹*Proc. Roy. Soc. Med.* 1932, Feb., 517; ²*Jour. Bone and Joint Surg.* 1931, xiii, 538; ³*Surg. Gynecol. and Obst.* 1932, April, 673; ⁴*Brit. Med. Jour.* 1931, July 18, 97; ⁵*Med. Jour. and Record.* 1931, Oct. 7, 329; ⁶*Jour. Amer. Med. Assoc.* 1932, April 2, 1143; ⁷*Surg. Gynecol. and Obst.* 1931, July, 1.

OTITIS MEDIA. (See also EAR, AFFECTIONS OF; INFLUENZA.)

OTITIS MEDIA IN INFANCY. (See also EAR, AFFECTIONS OF.)

Reginald Miller, M.D., F.R.C.P.

N. Asherson¹ classifies the acute otitis media of infancy under the following headings: (1) Otitis media neonatorum; (2) Agonal otitis of infancy; and (3) Otitis media of infancy. In the first two groups the cases are for the most part latent or clinically obscure in type.

1. *Otitis Media Neonatorum*.—In the newborn the tympanum is filled with gelatinous material which may act as a good culture medium for the bacteria introduced, soon after respiration and deglutition occur, by a retro-grade extension along the Eustachian tube. Thus the ear may become infected during labour, and otitis media may be present within a few hours of birth. Its diagnosis is difficult. It may show itself by high fever or by the presence of a blood-stained (later purulent) discharge from the ear. On the other hand, nothing wrong may be noticed until a lump is found behind the ear, i.e., a mastoiditis has occurred. Any of the symptoms of otitis media as it occurs in infants may be found in the neonatal cases.

2. *Agonal Otitis*.—This type of otitis is common, and is as a rule symptomless. It is usually bilateral, and the result more often of a mixed infection than of a pure pneumococcal infection. It is found chiefly in deaths from gastro-intestinal and respiratory diseases.

3. *Otitis Media of Infancy*.—In frank otitis media the presenting symptom is usually one or more of the following: pyrexia of obscure origin, obvious earache, a sanguineous or purulent discharge from the ear, or symptoms suggestive of meningismus or convulsions.

The fever of acute otitis may be very high (103° to 105°) and be the sole symptom of the ear infection. The tympanic membrane may be injected and bulging; but it must be clearly understood that the local signs may be very slight or even absent. The membrane may be pale and show no bulging. The possibility of such cases is amply proved by the defervescence which occurs on the appearance of a discharge from the ear. Obviously where the pyrexia is not accompanied by signs of earache, the diagnosis in such a case is of great difficulty. It is therefore of importance that the signs of earache in an infant should be well appreciated.

Earache in a small baby may be easily overlooked or misinterpreted. In the first place the crying is of the type suggestive of pain, and not of hunger

or thirst. The localization of the pain to the ears may be shown by head-rolling or banging, by plucking at the ears with the hands, by resisting examination of the ears or palpation of the mastoid region, and by the presence of the signs of meningismus.

Otorrhoea in cases of acute otitis media is usually at first blood-stained, and later becomes purulent. It is rare, except in mild cases, for the collection of fluid to escape down the Eustachian tubes into the pharynx. The tympanic membrane is resistant to the penetration of pus through it, and an inflammatory swelling is easily produced behind the ear.

Meningismus is well known to occur in cases of acute otitis media, showing restlessness, rigidity of the neck, and perhaps convulsions. Fever and vomiting may be present. The condition simulates that of acute meningitis, but the cerebrospinal fluid is normal though under pressure. Meningismus never occurs in chronic otitis media, and if cerebral symptoms develop after the discharge from the ear has been established, they are due to meningitis and not to meningismus.

TREATMENT.—To prevent the occurrence of otitis in the newborn Asherson recommends the routine use of 1 per cent **Argyrol** into the nose night and morning for the first few days of life. **Myringotomy** is indicated in the presence of mastoidism, meningism, pyrexia above 100° with earache, and bulging of the tympanic membrane, if the membrane is inflamed or there is a high temperature. During the painful period **Glycerin and Carbolic Drops** should be used, to be replaced as soon as the pain has subsided by **Spirit Drops**. The infant should wear a cap over both ears for warmth, and the ears should be syringed out with **Boric Lotion** to keep them free of discharge. Pain should disappear in two or three days, and the discharge in two or three weeks. The discharge may fail to subside in the presence of any gross nasopharyngeal condition, such as tonsils and adenoids.

Otitis and Gastro-enteritis.—The question whether acute otitis could be a cause of gastro-enteritis was fully discussed in last year's **MEDICAL ANNUAL** (p. 250). Asherson¹ is against such a possibility. L. Findlay² is also not in favour of such a hypothesis. He points out that there are marked differences between the two diseases in connection with their social and seasonal incidences.

REFERENCES.—¹*Arch. of Dis. Childh.* 1932, vii, 159; ²*Ibid.* 307.

OVARIAN HORMONES.

W. Langdon Brown, M.D., F.R.C.P.

It would appear from a paper by Edgar Allen¹ that wide differences exist between different species in respect to the ovarian hormones they produce. Evidently great caution must be shown therefore in applying the results of animal experiment to clinical work. He quotes Marcké's ingenious experiment of grafting a piece of endometrium into the anterior chamber of the eye of a rabbit where the vascular changes produced by the oestral cycle, by ovariectomy, or by injections of theelin can be directly observed. The corpus luteum of certain animals secretes a hormone, *relaxin*, which relaxes the pelvic ligaments at the time of parturition. This is not formed by the human corpus luteum, which is presumably another penalty women have to pay for the upright posture. Indeed, luteal hormones seem to play a smaller part in human reproductive functions than in those of animals; progestin (as Corner calls the luteal hormone) is not essential to normal gestation in women after the third month. Nevertheless he considers **Progestin** indicated therapeutically for repeated early abortion. Most specific actions attributed to luteal hormones require a preparation by **Theelin** first. The action of luteal hormones is directly complementary to the action of theelin. The **Anterior Pituitary**

is the principal stimulant to the growth of the Graafian follicles, so that an extract of this should be given for primary hypo-ovarian conditions.

A. D. Campbell and J. B. Collip,² continuing the researches detailed in the *MEDICAL ANNUAL* for 1932 (p. 337), report some benefit in the treatment of menorrhagia and metrorrhagia by the anterior-pituitary-like hormone contained in the human placenta.

R. Courrier³ calls the pre-hypophysis or anterior lobe of the pituitary the motor to the ovary. He stresses the antagonism between œstrin and progesterin. He succinctly describes the accepted sequence of events as follows: folliculin or œstrin is secreted in the course of maturation of the Graafian follicle, which leads to hypertrophy of the uterus; ovulation follows, and as the egg cell slowly descends the Fallopian tube the corpus luteum forms progesterin, which acts on the uterine mucosa, preparing a cradle as it were for the ovum. If fecundation occurs the corpus luteum persists and its progesterin continues to build up the uterine corpus; if it fails to occur, progesterin rapidly disappears, the endometrial construction breaks down under the revived influence of œstrin, which constitutes menstruation. He then proceeds to doubt the accuracy of this story, though it is not clear on his own evidence why he should do so.

C. Mazer and A. J. Wiseman⁴ hope for the synthetic production of **œstrin** at moderate cost, now that it is known to be a triple unsaturated oxyketone with the formula $C_{18}H_{22}O_{11}$. Its value in amenorrhœa they attribute to its ability to vascularize the uterus, thus rendering it more responsive to whatever ovarian function may remain. In obstinate cases 500 to 1000 rat units daily for three weeks may be necessary. Frequently repeated doses are the more effective, and they recommend **Progynon** tablets by the mouth; the ratio between the oral and the hypodermic dose being 5:1. W. Schoeller, Max Dohrn, and W. Hohlweg⁵ speak highly of œstrin in the relief of all climacteric disturbances and not merely the vasomotor ones, and also for secondary amenorrhœa and dysmenorrhœa.

Ovarian Virilism.—Adrenal virilism has been recognized since 1905; pituitary virilism has been more recently established by the work of Cushing and others; Sicard and Hagenau have described a pineal virilism. Now A. Cosaccesco and others⁶ have recorded an interesting case of virilism in a woman of 34 which was cured by the removal of a large cystic ovarian tumour. At the same time they engrafted slices of ovarian tissue, but as the condition of the patient continued to improve two and a half years after the operation, when the grafts would presumably have been absorbed, they attribute the success to the removal of the tumour. This proved to be composed of luteal tissue, and they explain their result on the known antagonism between the ovarian and luteal hormones. They quote two similar cases from the literature; in one of these, however, reported by Tuffier, both adrenals were also symmetrically enlarged to half the size of the kidneys. They find a connection between adrenal and ovarian virilism in the similarity of cellular structure in the corpus luteum and the adrenal cortex, to which others have also called attention, and recall the fact that the cells in the hilus of the ovary closely resemble the interstitial cells of the testes. They would agree with those who regard the ovary as a bisexual gland, and would account for this type of virilism as a condition in which the antagonizing action of an excess of luteal hormone on the ovarian one allows the normally present virilizing hormone to predominate. On this view ovarian virilism is a great exaggeration of changes which ordinarily follow the climacteric.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1931, Oct. 24, 1189; ²*Canad. Med. Assoc. Jour.* 1931, July, 9; ³*Presse méd.* 1931, Nov., 18; ⁴*Med. Jour. and Record*, 1932, Jan. 6, 35; ⁵*Amer. Jour. Med. Sci.* 1931, Sept., 326; ⁶*Presse méd.* 1931, Aug. 26, 1264.

PANCREAS, SURGICAL AFFECTIONS OF.*A. Rendle Short, M.D., F.R.C.S.*

Acute Pancreatitis.—F. Felsenreich¹ discards the usual classification into gangrenous, hæmorrhagic, etc., as clinically valueless, and reports 32 cases from the Vienna Clinic, which he describes as: (1) *Ultra-acute*, leading to a fatal result within a few days (8 cases); (2) *Acute becoming chronic*; and (3) *Acute cases rapidly getting well*. In the first group, operation is useless and leads to a fatal issue; in the second, if the patient is not obviously very ill, operate at once. Felsenreich advises incision of the pancreas itself as well as the capsule, and drainage either by gauze plugging or a rubber tube. If the patient's condition allows of it, explore and drain the bile-passages. [In our experience, if the ultra-acute cases are operated on within a few hours—and the pain is so great that everybody wants to get something done quickly—more than half recover. Incising the pancreas leads to serious bleeding, and serves no useful purpose.—A. R. S.]

Herr Ritter² (Düsseldorf) agrees with the above that operation may hasten death in the acute cases, and thinks there is a place for conservative treatment. Instead of simple plugging, necrotic pancreatic tissue may be removed by the diathermy knife or needle. Local and splanchnic anæsthesia may be valuable.

Pancreatic Lesions causing Jaundice.—W. Walters and E. Dehne³ present a study of 113 cases of obstructive jaundice operated on at the Mayo Clinic in which the cause proved to be in the pancreas. **Cholecystenterostomy** was the usual treatment: 15 per cent of those who survived operation lived for upwards of five years, and 25 per cent over three years. In 25 cases a piece of the pancreas was taken for microscopic examination; of these, 21 were malignant and only 4 inflammatory. Often a two-stage operation is indicated, and the anastomosis may be made to the stomach instead of the duodenum. They do not think the risk of ascending infection is serious.

Pancreatic Cysts.—F. Bernhard⁴ found that 6 of his cases were due to injury; of 5 others, in 2 there was a history of gall-stones. The injury cases usually remain free from further trouble after a drainage operation; in the inflammatory cases, a certain number eventually develop glycosuria, and a few more will one day suffer from acute pancreatitis.

REFERENCES.—¹*Arch. f. klin. Chir.* 1931, Dec., 307; ²*Zentralb. f. Chir.* 1931, Sept., 2418; ³*Surg. Gynecol. and Obst.* 1932, May, 832; ⁴*Deut. Zeits. f. Chir.* 1932, June, 281.

PARALYSIS DUE TO PRESSURE ON NERVES. (*See DRIVER'S THIGH, ETC.*)

PARALYSIS, GENERAL. (*See NEUROSYPHILIS.*)

PARALYSIS, INFANTILE. (*See POLIOMYELITIS, ACUTE ANTERIOR.*)

PARAPLEGIA, POTT'S. (*See SPINAL DISEASE AND DEFORMITY.*)

PARATHYROID GLANDS, DISORDERS OF.*W. Langdon Brown, M.D., F.R.C.P.*

The Parathyroids and the Metabolism of Calcium and Phosphorus.—Donald Hunter and H. A. C. Turnbull,¹ in an article on *hyperparathyroidism and generalized osteitis fibrosa*, review the whole subject with notes of all recorded cases operated on. They are definitely of opinion that the condition of the parathyroids in generalized osteitis fibrosa is one of hyperplasia and not neoplastic. In other respects their observations confirm the account given in the MEDICAL ANNUAL for 1932 (p. 342), which was based on Donald Hunter's earlier paper.

Just as hypoparathyroidism is represented by low blood-calcium, tetany, opacities in the lens, and damage to ectodermal tissues generally, as against hyperparathyroidism represented by high blood-calcium and decalcification of bone, so we have avitaminosis and hypervitaminosis. Where vitamin D is concerned its lack causes rickets, and its excess produces symptoms which in several respects recall hyperparathyroidism. But there are several important differences, and it is by a study of these differences that we may hope to obtain a clearer conception of calcium metabolism in general.

In vitamin D deficiency, the salient point is that the net absorption of calcium is decreased. By net absorption is meant the gross absorption less the amount re-excreted into the bowel. The calcium changes associated with the parathyroid, on the other hand, occur in animals deprived of their intestines. In clinical rickets the blood phosphorus and calcium may both be low. Inadequate calcification results, but it is primarily a disease of the bone rather than of the bone.

The preparation of a concentrated vitamin D, such as irradiated ergosterol, was followed by the recognition of its toxic action when given in excess. It then produces increased net absorption, a tendency to high blood calcium and phosphorus, excessive formation of densely calcified new bone, and a deposit of calcium in soft tissues, particularly the kidney and the aorta. It is interesting to note that these two structures are specially rich in phosphatase, the enzyme which is concerned in depositing calcium. The serum of rats in which hypervitaminosis has been induced will even cause heavy calcification in slices of bone *in vitro*. The toxic effects are not due, as was at one time thought, merely to the alcoholic solution of vitamin D, for they can be produced by pure calciferol (L. F. Harris²).

Now it is a striking fact that when maximal toxic overdoses of vitamin D are given, a reabsorption of bone occurs if there is no increased provision of calcium in the diet. It looks as if the bone is called upon to provide calcium when the available supply from the gut falls short. And it will fall short since the animal begins to refuse food. In hyperparathyroidism and severe hypervitaminosis we have, then, these striking features in common—high blood-calcium, deposits of calcium in the kidneys, and reabsorption of bone. It is not surprising, therefore, that the actions of parathormone and vitamin D have been held to be correlated—that vitamin D stimulated the parathyroids, and that in the absence of these glands vitamin D could no longer raise the blood-calcium (N. B. Taylor et al³). That has been disproved, and this difference stands out. Vitamin D increases the net absorption of calcium and phosphorus, parathormone merely raises the blood-calcium by withdrawing calcium from the bones, and actually leads to a loss of calcium in the body through the kidney. Now that these facts are clearly recognized, surely it behoves us to reconsider the clinical use of parathormone. As Leslie Harris says⁴: “It may be conceded that as an emergency measure in tetany the use of parathormone is admissible, to bring about a rapid cure of hypocalcæmia; but its continued use, we wish to suggest, is to be deprecated, since it tends merely to aggravate the underlying error by diminishing still further the inadequate retention of calcium and withdrawing still more mineral from the impoverished bone. That parathormone has proved invaluable after parathyroidectomy of course needs no emphasizing, but unfortunately there appears to be a tendency in some quarters to prescribe it, rather than vitamin D, wherever a calcium deficiency is suspected, and in fact certain parathyroid preparations are still advocated for rickets, nutritional tetany, and ‘disorders of calcium metabolism’ generally.”

This explains a difficulty: it had been noted that repeated injections of parathormone lost their beneficial effects. Thus the first case of post-operative

tetany treated by Collip's hormone in 1925 died in 1929, in spite of 160 units daily, reinforced by calcium lactate in large doses and transplantation of two parathyroids. One could hardly imagine a hormone producing an antibody to itself, yet here appeared to be an instance. Now we can see that keeping up the blood-calcium at the expense of the bones is a procedure which must defeat itself in time. It is clear that in such cases vitamin D rather than parathormone should be relied upon. But it must be realized that there is a risk of producing hypervitaminosis clinically. One mgrm. of irradiated ergosterol is adequate for an average case of rickets. Renal calculi have been reported after continued administration of 4 mgrm. daily; and two of these ended fatally (Putscher, Thatcher, quoted by Harris). Evidently there is not a wide gap between the optimum therapeutic dose and the toxic dose. It is almost impossible to produce hypervitaminosis by natural food stuffs, but W. E. Dixon suggested that excessive production of irradiated ergosterol by exposure of the skin to sunlight may play a definite part in increasing the frequency of renal calculi in the tropics.

It is only a small group of wave-lengths that are capable of converting ergosterol into the active form now known as calciferol; a sheet of glass can easily exclude them, and even vita-glass must be kept carefully free from dust to prevent this. As to the clinical use of ultra-violet rays, Miss Chick, in her Oliver-Sharpey lectures at the Royal College of Physicians, stated that they are only useful when it is desired to raise the calcium content of the blood. However, there appears to be one interesting exception to this, as we shall now see.

At first sight *osteitis deformans* (Paget's disease) appears to be the diametrically opposite to osteitis fibrosa. Yet in both there are two similar processes going on: apposition of new periosteal bone, and absorption of cancellous bone; the former predominates in Paget's disease and the latter in osteitis fibrosa.

Snapper contrasts the two diseases thus: Paget's disease comes on after 45 years of age, enlarging the skull, and thickening the spongy layer; the blood-calcium and phosphate, together with the urinary calcium, are all normal; there is no parathyroid adenoma, and removal of two parathyroids has no effect. Generalized osteitis fibrosa occurs in the young and is characterized by multiple bony cysts, with osteoplastic tumours, and great softening of the bones; there is excess of calcium and defect of phosphate in the blood and excessive output of calcium in the urine, and remarkable benefit results from the removal of the parathyroid adenoma. A similar condition can be produced experimentally by injections of Collip's parathormone in animals, as shown by Byrom (quoted by Hunter) and by J. L. Johnson.⁵ P. Delmas-Marsalet,⁶ however, points out that a rise of blood-calcium has been recorded in Paget's disease, and that a normal blood-calcium in generalized osteitis fibrosa is reported by Wilder. He therefore is in favour of regarding the two diseases as essentially similar, especially as he has cured a case of either condition by the same method—**Vitamin D** and injections of **Sodium Gluconate**. Max Ballin and P. F. Morse⁷ take a somewhat similar view, while strongly advocating surgery for osteitis fibrosa.

Recently some extraordinary successes with **Ultra-Violet Rays** have been recorded in the treatment of osteitis deformans. In the light of what has already been said, this would suggest that a failure of net calcium absorption and an excess of phosphatase, the calcifying enzyme, are the principal factors in the disease, and that the histological resemblances between it and osteitis fibrosa are only another example of the simulation of parallel changes due to disturbances of parathormone and vitamin D metabolism, which on deeper analysis will prove to be illusory.

CHANGES IN BLOOD, BONES, KIDNEYS, AND CATALYTIC AGENTS IN VARIOUS DISEASES AFFECTING BONE.

DISEASE	BLOOD		CATALYTE	TETANY	PRINCIPAL BONY CHANGES	KIDNEYS
	Ca	P				
Osteitis fibrosa	..	—	Parathormone +	0	Osteoclasia	Calculi
Hypervitaminosis D	..	+	Vitamin D +	0	Excessive calcification, followed by re-absorption	Calculi
Rickets	Normal or —	Vitamin D —	+	Deficient calcification and irregular ossification	
Osteomalacia	..	Variable	Vitamin D —	+	Deficient calcification, spontaneous fractures	
Renal rickets	..	— +	Phosphatase +	+	Delayed union of epiphyses, stunting, irregular ossification	
Cœliac rickets	..	— Sometimes —	Vitamin D —	+	As in rickets	Chronic nephritis
Osteogenesis imperfecta	..	Normal	0	0	Failure of osteoblasts, spontaneous fractures	
Osteitis deformans	..	Normal	Phosphatase +	0	Increased formation of periosteal bone, osteoclasia of cancellous bone	

Sepsis and Tetany.—It has been repeatedly observed that tetany may follow parathyroidectomy, even before the blood-calcium has fallen to normal. Presumably the body had become adjusted to the higher level of blood-calcium. But another factor should be borne in mind. G. C. Linder, C. F. Harris, and F. R. Fraser,⁶ in reporting two cases of persistent tetany after thyroidectomy, comment on focal sepsis as an important factor in increasing the severity of the condition and in preventing its successful treatment. The same may well apply to intentional parathyroidectomy, and is analogous to the way in which focal sepsis interferes with insulin as proved by G. Graham.

Calcium Metabolism and Diseases of the Bone.—The table on p. 328 (W. Langdon Brown⁹) shows the changes in the blood, bone, and kidneys, and in catalytic agents such as parathormone, vitamin D, and phosphatase, in various bony diseases. The association of tetany with a low blood-calcium is clearly seen.

REFERENCES.—¹*Brit. Jour. Surg.* 1931, Oct., 203; ²*Lancet*, 1932, i, 1031; ³*Canad. Med. Assoc. Jour.* 1931, July, 20; ⁴*Lancet*, 1932, i, 1036; ⁵*Amer. Jour. Med. Sci.* 1932, June, 761; ⁶*Presse méd.* 1932, Feb. 20, 282; ⁷*Ann. of Surg.* 1931, Oct., 592; ⁸*Quart. Jour. Med.* 1931, July, 469; ⁹*Post-graduate Med. Jour.* 1932, Nov., 422.

PARATHYROID TUMOURS, SURGICAL TREATMENT OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The surgery of the parathyroids has received considerable attention during recent years. It has been shown that hyperparathyroidism is present in cases of generalized osteitis fibrosa. In these cases, tumours of the parathyroid were found at operation or at post-mortem. Frequently it is not possible to palpate the tumour in the neck. Parathyroid hyperfunction is engaging the attention of many surgeons and laboratory workers at the present time. The operation of removal of the parathyroid is becoming more frequently indicated.

Max Ballin¹ draws attention to the *technique of parathyroidectomy*. The usual collar incision as in goitre is employed. The parathyroid muscles are separated in the mid-line from the larynx to the sternal notch. It is never certain on which side the parathyroidectomy may have to be performed. Only a few parathyroid tumours have been palpated before operation. When the thyroid lobe is properly exposed, it is first inspected on its anterior and lateral surfaces for parathyroids. Then the lobe is gently turned mesial to expose the structures posterior to it. The inferior thyroid artery is located between the carotid and the gland by teasing apart the fine areolar tissue in this space. With two fine tissue forceps the inferior parathyroid body is readily exposed and recognized by its size, shape, and colour. The superior parathyroid lies somewhat higher up, usually at the junction of the upper and middle third of the thyroid edge. A little more blunt dissection of the areolar tissue will expose the recurrent nerve. If no enlarged parathyroid is found, the other side must be explored. If the symptoms from which the patient is suffering are severe, it is better to remove three rather than two parathyroids. In the case of a definite parathyroid adenoma of 1 cm. or more in size, removal of this is probably all that is necessary.

Ballin emphasizes the following points:—

1. There are usually four parathyroids at the places mentioned, but variations of site are frequent (Terry and Searls).

2. The colour of these epithelial bodies is a yellowish brown, according to their fat content or blood content. The most frequent mistakes made have been the removal of small thyroid adenomata, lymph-glands, or fat tissue. Thyroid tissue is easily recognized; fat has no resistance to the examining finger; and lymph-glands, while yellow-pink, are usually more round and regular in contour. The parathyroids are usually more oblong and stellate,

reminiscent of a nerve ganglion. If in doubt a frozen section should answer the question as to whether parathyroid tissue has been removed.

3. At times identification of the parathyroid has not been accomplished; at least three such cases have been confessed to.

4. In some cases primary ligation and division of the inferior thyroid artery will bring the yellowish-brown parathyroid into view (E. P. Richardson).

5. Subtotal lobectomy has to be done frequently before the parathyroid can be exposed and removed. Thyroparathyroidectomy is the operation most of the twenty-odd surgeons who reported their cases have performed. It has advantages over simple parathyroidectomy in that it gives better exposure and more space for the delivery and handling of the parathyroids. Some parathyroids are often embedded in the thyroid and cannot be removed without more or less of a lobectomy (Willbuck, 7.8 per cent). Furthermore, the thyroid in parathyroidism is often goitrous, and may contribute also to hypercalcaemic and arthritic conditions (Hunter). Therefore, a thyroparathyroidectomy will be preferable in the majority of cases. Only in children, and if the thyroid appears normal and does not interfere with the technique, should the parathyroids be removed alone. (Most of Ballin's cases had associated adenomatous goitre.)

A. J. Walton² gives a thorough account of this interesting subject. He states that only a few years ago the anatomy of the apparently insignificant parathyroid glands was hardly known. Many believed that they were only misplaced portions of thyroid tissue or of small lymphatic glands. The glands are so small and so hidden that the diagnosis of a parathyroid tumour depends almost entirely upon indirect evidence. In four cases referred to by Walton investigation into the bone changes and upon the calcium and phosphorus metabolism enabled Dr. Donald Hunter to say dogmatically that a tumour was present. The number and position of the parathyroids is variable (*Plate XXXV*), but as a general rule there is a superior and inferior body on each side, although in many cases these may be increased to three or four.

Tumours of the parathyroid body have been regarded as very rare, but they will probably prove to be much more common than was at one time thought. Three of Walton's case reports will be mentioned very briefly, but his paper should be studied by all who undertake the treatment of parathyroid tumours.

Case 1.—Female, aged 41. Pains in joints and limbs. Diagnosed as osteo-arthritis. X-ray evidence of osteitis fibrosa. Hypertonicity of muscles; tenderness on pressure over shafts of long bones; tender swelling in lower end of right ulna. X rays showed general osteoporosis and multiple cyst-like areas in right ulna, right tibia, right patella, and phalanges. Increase of serum calcium and a low plasma phosphorus. Tumour removed from region of left inferior parathyroid. Good recovery. Great improvement of all symptoms.

Case 2.—M. R., female, aged 37. Two years pain in knees, hips, heels, and arms. Weakness steadily increasing. For two years unable to get about. Swelling of right lower jaw. Limbs becoming stiff and distorted. Swelling of left forearm and right hand. In many hospitals since. In May, 1930, admitted to the London Hospital. Much deformity. Height 4 ft. 10 in. In bed totally disabled. Hips and knees flexed, cannot move either arm. Great pain in limbs. Bones very tender. All long bones much distorted and bent. Large tumours right lower jaw, dorsum of right hand, and second metacarpal. General osteoporosis. Heads and necks of both femora absent. All long bones thin and much bent. Calculi in right kidney. Serum calcium increased. No tumour in neck. Operation on July 2, 1930. Small tumour $\frac{1}{2} \times \frac{1}{2}$ in. removed from behind thyroid fascia at site of right inferior parathyroid. Great improvement since operation.

Case 3.—A. F., female, aged 40. During pregnancy twelve years ago difficulty in walking. Easily tired. Child stillborn. Two years ago pain in joints; interfered with walking. Two and a half years, swelling in right tibia, portion removed. Severe

PLATE XXXV

PARATHYROID TUMOURS

(A. J. WALTON)

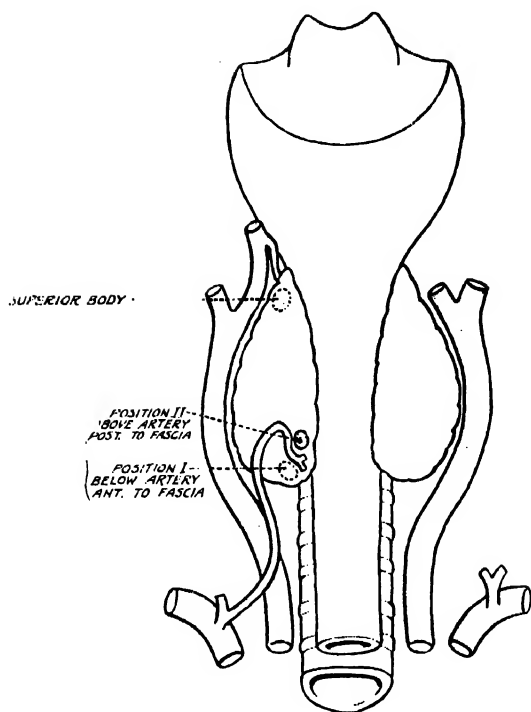


Fig. A. Position of parathyroid bodies as seen from behind.

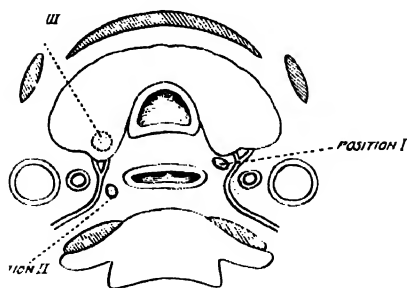


Fig. B. Relation of parathyroid bodies to the thyroid fascia.

*By kind permission of the
British Journal of Surgery*

pain in right leg since. Swellings developed on left ring-finger, forehead, and chin; varied in size from time to time. In bed owing to pain in joints two years. Some frequency of micturition. Six years ago stone removed from left kidney. Small swelling felt in left lower pole of thyroid. Hard, bony tumours in lower right tibia, skull, left ring-finger. General osteoporosis. Serum calcium increased. Low plasma phosphorus. Albumin in urine; right and left renal calculi. Operation on Aug. 29, 1930. Small adenoma felt in lower left lobe. Large rounded tumour 3 × 1 in. in thorax behind sternum and to left of trachea; easily dislocated upwards and removed. Wound drained and closed. Patient recovered well from operation and has made great improvement since.

REFERENCE.—¹*Surg. Gynecol. and Obst.* 1932, May, 806; ²*Brit. Jour. Surg.* 1931, Oct., 285.

PARATYPHOID FEVERS. (See also TYPHOID FEVER.)

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—Creyx¹ records a case of primary urogenital infection in the form of *pyelocystitis* and *orchi-epididymitis* due to *B. paratyphosus B* in an adult. Apart from pyuria, the urinary symptoms were very slight. The genital symptoms on the other hand were very marked, but atypical in that though the testis and epididymis were considerably swollen they were neither painful nor tender, and the inflammation was very slow in subsiding.

S. Wolff² reports the case of a female infant, age 6 months, who on the twenty-first day of paratyphoid B septicæmia, without bacilli being found in the faeces or urine, developed typical symptoms of *purpura hæmorrhagica*. The Widal reaction was positive for *B. paratyphosus B* in 1-1800, and negative for *B. typhosus* and *B. paratyphosus A*. Death took place on the forty-fourth day of disease. There was no autopsy.

In view of the rarity of *intestinal perforation* in paratyphoid fever, it is noteworthy that P. Bonamy³ has collected 18 examples in patients aged from 17 to 51 years: 11 occurred in paratyphoid B and 7 in paratyphoid A; 4 recovered after operation and 11 died.

S. A. Rose⁴ reports the case of a girl, age 12 years, who in the first week of an attack of paratyphoid fever B developed acute *appendicitis*. Laparotomy was performed and the inflamed appendix removed. The temperature remained raised for about a fortnight after the operation. Subsequent recovery was uneventful. According to Rose, the association of appendicitis and enteric fever is commoner than is generally supposed.

REFERENCES.—¹*Bull. Soc. méd. Hôp. de Paris*, 1932, 242; ²*Zeits. f. Kinderheilk.* 1931, lii, 156; ³*Thèse de Paris*, 1932, No. 323; ⁴*Arch. of Pediat.* 1931, 785.

PELLAGRA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

DISTRIBUTION AND ETIOLOGY.—From the Bombay Deccan, John Lowe¹ reports on 40 cases of pellagra seen among lepers. The disease has been observed with increasing frequency during the last six years. About 10 of these cases proved fatal, and in 6 recurrences were noted. As usual, the disease increased in the cold season from December to March and the incidence rate was four times as great in women as in men, but nervous and mental symptoms were not marked clinical symptoms. The diet of the patients worked out at 2300 to 2700 calories; protein and fat were deficient, but very little maize was eaten and the cause of the outbreak was not ascertained. B. C. Guha² discusses the rôle of vitamin B₂ in the etiology of pellagra. He has described a patchy loss of fur in rats living on a diet deficient in vitamin B₂ which was cured by giving Lilly's liver extract No. 343, and marmite has been found to be of value by others, but hæmin was not beneficial. I. Sabry^{3,4} discusses the chemical nature of 'pellagra toxin', and suggests on theoretical grounds that

the toxin is related to the hyperpigmentation of pellagra, and that it 'must be a dioxyphenylamine'. He claims that **Sodium Thiosulphate** is of value in the treatment of pellagra given by daily intravenous injections of 10 c.c. of a 10 per cent solution up to twenty to sixty injections. He states that he contests the vitamin theory 'from top to bottom'. J. B. Guthrie⁵ discusses the frequency of achlorhydria in pellagra and considers the presence of hydrochloric acid in the stomach as a point of good prognosis. T. R. Boggs and P. Padget⁶ in Baltimore found that 40 out of 102 pellagra cases were post-alcoholic, a form that is four times as common as before prohibition.

REFERENCES.—¹*Ind. Med. Gaz.* 1931, Sept., 491; ²*Brit. Med. Jour.* 1931, ii, 53; ³*Lancet*, 1931, ii, 1020; ⁴*Jour. Trop. Med. and Hyg.* 1931, Sept. 15, 303; ⁵*Ibid.* 1932, March 1, 71; ⁶*Johns Hopkins Hosp. Bull.* 1932, Jan., 21.

Macdonald Critchley, M.D., F.R.C.P.

HISTORY.—Pellagra is not of common occurrence in this country, but occasionally small epidemics occur, in which children may in particular be afflicted. It is nearly 200 years since the original description of the malady was written in 1735 by Gaspar Casal, a Spanish physician. Casal's book did not actually appear until 1762, but in the meantime F. Thiéry, the Physician to the French Ambassador in Spain, had learned of the disease from Casal, and had written in 1755 a description of the '*mal de la Rosa*' as it was called. The name 'pellagra' is attributed to the paper by Frapolli, in 1771. Thiéry, in his original account in the *Journal de Médecine, Chirurgie et Pharmacie*, 1755, p. 337, gives a detailed description of the clinical features, and summarizes the distinctive and inseparable symptoms as follows:—

1. The constant trembling of the head, which although it is common to all patients, is in many so lasting they are not a single moment without an irregular movement of the entire body. In the hospital of Santiago the author cured a little woman whose body, especially the upper half, was balanced like a swallow pushed by a varying wind; in order to hold herself steady, she had to move her legs very fast to prevent herself from falling down to the ground at any moment.

2. The burning pain of the mouth, vesicles on the lips, and a coating on the tongue.

3. The distressing weakness of the stomach and the weakness of the entire body, especially of the legs, and a strange laziness and carelessness.

4. The crusts of the metacarpals and metatarsals and a sort of collar on the upper part of the neck.

5. The scorching heat which torments them, especially in the chest.

6. That smoothness and delicate fineness of the skin which does not resist either heat or cold; and

7. The heaviness, which without any known cause attacks them and causes them to give way to a sad crying, a phenomenon which by itself is a pathognomonic sign of the affection.

Boggs and Padget¹ have made a close study of a series of 102 personally observed cases of pellagra occurring at the Baltimore City Hospital, over a period of twenty years. The authors divide their cases into three well-defined groups: (1) Simple pellagra; (2) Post-alcoholic pellagra; and (3) Pellagra complicating some other disease. Dermatitis was the commonest symptom on admission to hospital, diarrhoea was the second, and soreness of the mouth was the third most frequent complaint. Characteristic neurological complaints include, according to O. Langworthy²: severe headaches; burning pains in

the extremities, with tenderness of the nerve-trunks; impairment of sensation; ataxia, especially of the legs; tremor in the limbs, face, and tongue; dysarthria; dysphagia; and exaggerated deep reflexes often associated with Babinski responses. In Boggs and Padget's series, spinal symptoms resembling subacute combined degeneration were present in 45 per cent; stomatitis and diarrhoea occurred in 75 per cent; anamia was found in 80 per cent; and an absence of free hydrochloric acid in 90 per cent. Mental symptoms occurred in one-half the patients. Various types of psychosis have been described in pellagrins:² depression with suicidal tendencies are common, but excitement, delirium, or stupor may occur. Epileptic attacks are not unknown. In the Baltimore cases, **Liver Diet** was found to be the most satisfactory form of therapy; of those treated with liver 20 per cent died, as contrasted with 69 per cent of those not so treated. Neurological signs proved resistant to liver feeding.

The association between pellagra and chronic alcoholism is of interest, and Boggs and Padget, in discussing this aspect of their problem, enumerate three possible ways in which this relationship might be explained: (1) Pellagra might result from some element in the alcoholic drink; (2) Simple deprivation of food might be responsible; and (3) The pellagra-preventing substance is either destroyed by the alcohol or else cannot be absorbed on account of a chronic alcoholic gastro-enteritis.

Langworthy studied carefully the neuropathology of a fatal case of pellagra in a young woman, also under treatment in Baltimore. Very diffuse neuronie changes were found, with accumulations of pigment in the cells of the sensory and autonomic ganglia and those in the spinal cord and brain-stem. The maximum spinal change lay in the antero-lateral columns, particularly in the spinocerebellar tracts. The heart was extremely small—as frequently is the case in pellagra—and the fibres were atrophied.

Amongst the other morbid findings described as typical of this disease may be mentioned opacity and thickening of the pia-arachnoid, at times associated with sanguineous or purulent exudates; and fatty, pigmentary, and hyaline changes in the smaller cerebral arteries and capillaries. In addition to pigmentary changes, the nerve-cells often show alterations in the fibrils, in the nucleus, and in the fibres. According to S. A. K. Wilson³ there is an increase in the π granules of the neurilemma.

REFERENCES.—¹*Bull. Johns Hopkins Hosp.* 1932, 1, 21; ²*Brain*, 1931, liv, 291; ³*Proc. Roy. Soc. Med. (Neurol. Sect.)*, 1914, lxxii, 31.

PELVIC INFLAMMATION.

Beckwith Whitehouse, M.S., F.C.O.G.

Mode of Infection.—The commonly accepted opinion that chronic infection of the myometrium and uterine appendages is generally via the cervix and endometrium has recently been challenged by N. Z. Ivanov.¹ This author has made a detailed study of inflammations involving the lower genital tract, and his investigations afford strong evidence to show that the path of infection follows the paravaginal blood-vessels and lymphatic plexuses rather than the more obvious cervical and corporeal uterine epithelium. More than 50 per cent of all women, according to Ivanov, show evidence of a vaginitis of greater or lesser degree, the vagina being very susceptible to infections of all types. Many of these infections involve the entire vaginal wall and extend to the paravaginal connective tissue. By microscopical investigation the author found that after penetrating the vaginal mucosa, the infection localized itself in the paravaginal and, later, the parametrial connective tissue, travelling between the muscle fibres along the course of the blood-vessels and lymphatics. Extension to the myometrium takes place via the planes of cellular tissue at

the base of the broad ligaments and especially through the localized thickening of the tissue which constitutes the so-called 'cardinal ligaments'. Although such infection may penetrate the myometrium and result in a chronic sclerosis of the uterine wall it seldom extends to the endometrium.

It will be noted that this opinion is at variance with the views generally held, which regard chronic uterine fibrosis as secondary to a preceding infective endometritis. Ivanov goes further and expresses the opinion that inflammatory processes involving the Fallopian tubes seldom spread directly from the endometrium. Such processes generally involve only the distal portions of the tube, the proximal ends being unaffected. The author regards this as evidence of infection by the paravaginal route.

If the author is correct in his contention of the importance of the paravaginal plexuses as the main portal of entry of infection of the internal genitalia, then the treatment of vaginal and vulval infective lesions becomes of paramount significance. Some support for Ivanov's view is forthcoming in the experimental production of tuberculous lesions of the ovaries and tubes in animals by inoculation of the vulval and vaginal tissue with the tubercle bacillus.

Conservative Treatment of Adnexal Inflammation.—The treatment of inflammatory lesions of the uterine appendages is a matter of perennial interest owing to the frequency with which the problem is presented. The decision as to whether it is better to operate or not to operate has commonly to be made, and therefore careful data dealing with the after-results of treatment cannot but be of value. F. C. Geller² and I. Krinke have followed up 162 cases of adnexal inflammation treated on purely conservative lines, and the result of the investigation points to the conclusion that tubal inflammatory lesions should first be treated conservatively. Surgical measures should only be considered after the total failure of conservative methods. In the authors' series some of the patients were treated by the application of **Heat** by means of sitz baths, arclight, or diathermy; others by **Protein Injections** or **Vaccino-therapy**. When suppuration occurred pus was evacuated by a simple posterior colpotomy or vaginal incision through the posterior fornix. The average duration of treatment in the whole series was twenty-five days, and approximately the same results were obtained by heat as with vaccine or protein therapy. The value of the method was based upon relief of symptoms, regression of the inflammatory swelling, and the occurrence of subsequent pregnancy: 78.7 per cent of the patients reported that they were free from symptoms, and of 51 women who were re-examined at the end of two to five years, the adnexal enlargement had disappeared in 50.9 per cent. It is interesting to note that slightly over 23 per cent of the patients subsequently became pregnant, and even 17.5 per cent of the women with bilateral infection of the uterine appendages came into this category. Surgical intervention was ultimately required in 21.6 per cent only.

Contrasting these results with those obtained after primary surgical treatment, Geller and Krinke observe that an equal number of patients were asymptomatic after conservative therapy as after radical methods, and more remained well after conservative non-surgical treatment than after conservative surgery. It is generally recognized that conservative operations in cases of adnexal inflammatory disease are not followed by a high incidence of pregnancy, and therefore the authors' results in this respect are of some interest. No reference in the communication is made to the occurrence of subsequent ectopic gestation, and therefore presumably no instance was encountered.

REFERENCES.—¹*Gynéc. et Obst.* 1931, xxii, 208; ²*Monats. f. Geburtsh. u. Gynäkol.* 1930, lxxvii, 289.

PEMPHIGUS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Senear-Usher Syndrome.—In 1926 Senear and Usher published 11 examples of a curious condition which combines the symptoms of lupus erythematosus and pemphigus. R. L. Gilman¹ has collected reports of 14 additional cases, including one of his own. In Senear and Usher's original descriptions the manifestations are as follows: On the face and scalp either typical discoid patches with 'carpet-tack' scales, or an inflammatory reaction suggesting a severely congested seborrhœic dermatitis are present. On the trunk there are lesions resembling pemphigus, especially in the seborrhœic areas. These consist of flaccid bullæ that rupture readily and develop into areas of crusted oozing dermatitis, or into an inflammatory papule with a thick, greasy, or even keratotic scale and crust. The lesions involute spontaneously and leave pigmented patches. The symptoms are mild; itching may occur, but the course is usually benign. The cases were equally divided between the sexes, and the age was usually the fourth or fifth decade. Of the cases collected by Gilman, 3 are considered to be doubtful examples of this condition. Of the remaining 11, all except one occurred in the fifth and sixth decades, the one exception being in a boy of 7. The author looks upon the condition as a definite entity.

J. T. Ingram² describes a similar case in a woman of 66. He also agrees with Wise that the condition should be classed as a benign form of pemphigus, possibly modified by its occurrence in a seborrhœic individual.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1931, July, 84; ²*Brit. Jour. Dermatol. and Syph.* 1932, May, 233.

PENIS, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Circumcision.—F. C. Schurmeier¹ has used for many years what he calls the 'three-in-one' frænal stitch (*Fig. 55*). As a dressing he recommends vaseline gauze, cut as in *Fig. 56*. The long end is passed through the slit, and the resulting loop is passed over the penis. Slight traction is then made (*Fig. 57*), which effectively controls oozing, as it acts as a tourniquet. This

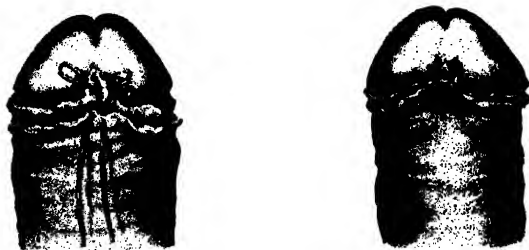


Fig. 55.—The 'three-in-one frænal stitch'. (After Schurmeier.)

dressing does not slip, it keeps the wound free from urine, and it is painlessly removed on the fourth day.

For circumcision in adults local anæsthesia is unsurpassed. A 2 per cent solution of novocain or novutox is used. E. Sunderland-Rawlings² finds a continuous suture of fine catgut, not drawn too tightly so as to allow serous oozing, is the best method of completing the operation. An accurately placed suture avoids a bag of tissue at the frænum. Twenty per cent of male venereal cases require circumcising. The dressing recommended after circumcision in venereal cases is **Vaseline Gauze soaked in Acriflavine**. The dressing is

changed on the second day and the suture removed on the fifth day. [The reviewer has found that a good method of preventing post-operative priapism, a troublesome complication after circumcision in adults, is to provide an intelligent patient with an **Ethyl Chloride Spray** which he can apply to the



Fig. 56.—Vaseline gauze 'tourniquet' dressing for circumcision. (After Schurmeier.)

organ as the need arises.—H. B.] A. E. Sawday³ considers that too many unnecessary circumcisions are performed in infants. Dilatation of the prepuce with separation of the mucous membrane from the glans is all that is necessary in many instances.



Fig. 57.—Method of applying the dressing shown in Fig. 56. (After Schurmeier.)

Phimosis is very unusual in the lower animals. H. Kirk⁴ records a case of a cat with phimosis which was so severe as to cause absolute retention of urine. The animal was successfully treated by operation.

Recurrent Herpes Genitalis in the Male.—J. Avit-Scott⁵ infers that many cases are secondary to prostatitis, and advises that attention should be directed to the primary focus. Cases of recurrent herpes respond immediately to circumcision.³

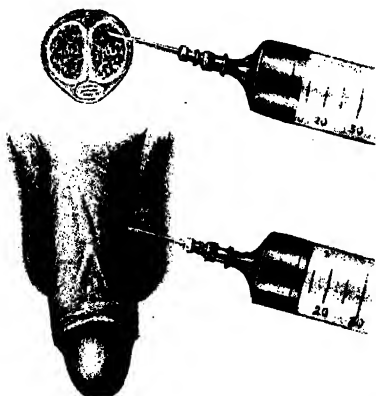


Fig. 58.—Showing the method of deflating and irrigating the corpora cavernosa. (After McKay and Coulson.⁷)

Persistent Priapism.—Like all who have tried it, C. Greenberg⁶ finds that deflation of the corpora cavernosa by means of an aspirating needle, with repeated injection and aspiration of normal saline, is eminently successful in the treatment of persistent priapism, from whatever cause (Fig. 58). The manoeuvre is repeated as soon as the organ becomes erect; eventually restitution is brought about.

Carcinoma of the Penis.

Cancer of the penis is very uncommon in the uncircumcised. A. L. Wolbarst⁸ says there is no recorded case of the disease. Chronic balanitis in the middle-aged and elderly should always be regarded as potentially malignant. The diagnosis of penile cancer in well-established cases is easy; the principal lesions to be excluded are papilloma and syphilis. Penile cancer spreads by lymphatic

channels, and metastases are carried to the inguinal glands fairly early in the course of the disease. W. E. Leighton⁹ concurs with most observers that the best results follow **Complete Amputation**, together with a careful dissection of the inguinal glands. On the other hand, H. H. Young¹⁰ states that total emasculation is unnecessary. He makes a complete dissection of the inguinal glands, performs partial amputation of the penis, *removing as well the fascia from that part of the shaft of the penis which remains*. I. G. Lewis¹¹ has traced 31 cases treated by Young's method: 15 are living; 8 cannot be traced; and 8 are dead.⁹ In none was there any recurrence in the penile stump. In Leighton's series 10 patients had had partial amputation before coming to his clinic and in all these recurrence of cancer had taken place. F. H. Colby and G. G. Smith¹² have found a definite correlation between the histological grade of malignancy and the course of the disease. Of cases estimated as of low malignancy, a greater percentage lived for a longer period of time after operation than those of high malignancy.

Radium treatment⁹ of this variety of carcinoma has, on the whole, been somewhat disappointing.

H. Meller¹³ reports a case of leiomyosarcoma in a patient of 64, while G. J. Busman and A. R. Woodbourne¹⁴ record an example of Paget's disease of the glands in a negro.

REFERENCES.—¹*Illinois Med. Jour.* 1931, April, 319; ²*Charing Cross Hosp. Gaz.* 1931, 146; ³*Brit. Med. Jour.* 1931, ii, 14; ⁴*The Veterinary Record*, 1931, Aug. 8, 832; ⁵*Lancet*, 1931, ii, 1972; ⁶*Urol. and Cutan. Rev.* 1932, xxxvi, 13; ⁷*Jour. of Urol.* 1928, xix, 121; ⁸*Lancet*, 1932, i, 150; ⁹*Amer. Jour. of Cancer*, 1932, March, 287; ¹⁰*Jour. of Urol.* 1931, xxvi, 285; ¹¹*Ibid.* 295; ¹²*Ibid.* 461; ¹³*Wien. klin. Woch.* 1932, Jan. 8, 49; ¹⁴*Arch. of Dermatol. and Syph.* 1931, xxiv, 396.

PERICARDITIS, CHRONIC: SURGICAL TREATMENT.

A. Tudor Edwards, M.Ch., F.R.C.S.

The increase of operations for cardiomyolysis by removal of greater or lesser portions of the thickened adherent pericardium has stimulated some research on the influence of the pericardium on the cardiac function. J. H. Gibbon and E. D. Churchill,¹ in a series of experiments on the pericardium, came to certain conclusions: (1) That removal of the pericardium was not detrimental to the circulation even when signs of cardiac decompensation had been experimentally produced; and (2) Increased work is accomplished by increase in the diastolic size of the heart. Removal of the pericardium, which ordinarily limits this normal cardiac dilatation, materially increases the degree of dilatation. They conclude, therefore, that decompression of the heart may, in favourable instances, enable it to compensate more adequately for valvular defects.

U. G. Bijlsma and J. W. Le Heux² agree with Gibbon and Churchill that a certain degree of dilatation of the heart favours an increase in cardiac action. From their experimental work, they came to certain conclusions: (1) The pericardium serves as a protective measure against excess dilatation of the heart; (2) Dilatation of the heart in the presence of an intact pericardium to the 'physiological dilatation end-point' is impossible and the heart cannot draw upon it as a measure of physiological reserve.

H. Fischer³ states that when adhesions of the pericardium are present binding it to the anterior chest wall and to the diaphragm, removal of the overlying anterior bony chest wall is recommended. When adhesions are present between the heart and the pericardium, their separation has occasionally met with success, but decortication is much more reliable. Separation of adhesions is not without risk, as is shown by a case recorded by this author. After the adherent pericardium had been freed from the right ventricle and right auricle and left ventricle, the liberated right heart enlarged progressively,

swelling and ballooning out, and the cardiac action became weaker and finally came to a standstill in spite of stimulation. Subsequent histological examination showed marked scarring and degeneration of the musculature of the right heart. As a result of this experience, Fischer advocates decortication and freeing of the left ventricle only, an operation which he regards as less dangerous, and the results of which are said to be equally favourable.

REFERENCES.—¹*Jour. Clin. Invest.* 1931, June, 406; ²*Arch. f. exper. Pathol. u. Pharmacol.* 1931, clix, 12; ³*Forta. d. Therap.* 1930, 557.

PERITONITIS.

A. Rendle Short, M.D., F.R.C.S.

J. J. Robb¹ does not accept the view that the vomiting, constipation, and abdominal distress seen in peritonitis are due to obstruction by coils of bowel united by plastic adhesions. For instance, spinal anaesthesia will produce an action of the bowels; so may an intravenous saline injection. Robb believes that in early cases, at any rate, the physiology of the condition is overaction of the sympathetic, causing spasm of the pyloric, ileocaecal, and other sphincters, and paralytic distension of the stomach and small and large intestines. At the same time the kidney vessels are contracted, giving rise to anuria; the vasomotor and sudomotor nerves of the skin are excited, causing the pallor and sweating. The deductions for treatment are far-reaching. The peritoneum must not be further irritated by gauze packs, swabs, or rubber tubes. No attempt should be made to overcome the intestinal obstruction, which is protective, but $\frac{1}{4}$ gr. of **Morphia**, and $\frac{1}{100}$ gr. of **Hyoscine** should be administered. Fluid should not be given either by mouth or by rectum; it will not be absorbed. **Pituitrin** is contra-indicated. There comes a turning-point in the case, of course, when steps must be taken to relieve the dehydration and obstruction; when definite pus is seen in a wound or drain, or when the patient says he feels too hot, or when the sum of the clinical manifestations gives the impression that improvement is beginning, it is time to stop morphia, and give $\frac{1}{100}$ gr. of **Atropine**, every four hours. **Bromides** are given by the mouth. One or two pints of normal **Saline** with 4 per cent **Gum Acacia** are given intravenously, and the stomach is washed out and raw meat juice given. The result will usually be that the bowels will act freely, perhaps incontinently. Two hours after the change of treatment an enema may be given, but it must be stopped if there is any upper abdominal pain or vomiting. Robb has treated 39 cases of general peritonitis on these lines, with only 1 death, from pneumonia. Most of them followed appendicitis or a perforated duodenal ulcer. The purpose of the atropine is to release the sympathetic overactioning; it has no direct action on the nerve-supply of the intestine, but abolishes hypertonus.

In Central Europe the **Serum Treatment** of septic peritonitis is in favour. W. Spitzer² (Trautenau) reports 36 cases of late diffuse peritonitis treated with a *B. coli* antitoxin serum, with or without an anaerobe serum also, of which 14 per cent died. It is given intraperitoneally. H. Kunz³ (Graz) writes to the same effect; he gives 20 c.c. intravenously and 40 c.c. intramuscularly.

Prevention of Adhesions.—A. Ochsner and E. Garside⁴ (New Orleans) present an experimental study, well illustrated, which goes to show that post-operative peritoneal adhesions can be prevented by leaving in the abdomen saline containing **Papain and Trypsin**. The solution found most satisfactory was between 1-50,000 and 1-10,000 of papain in saline. It will not succeed in the presence of infection. Papain is derived from the unripe fruit of the *Carica papaya*, or papaw tree; a sterile preparation can be obtained. It is supplied by Parke, Davis & Co.

REFERENCES.—¹*Brit. Jour. Surg.* 1932, April, 634; ²*Deut. Zeits. f. Chir.* 1932, Jan., 105; ³*Wien, klin. Woch.* 1932, June, 709; ⁴*Surg. Gynecol. and Obst.* 1932, Feb., 338.

PERITONITIS, PNEUMOCOCCAL. *John Fraser, Ch.M., F.R.C.S.Ed.*

Continental literature, and particularly French literature, contains many recent references to the subject of pneumococcal peritonitis. Discussion continues to centre round the question of appropriate treatment: Should operation be immediate—that is, as soon as the diagnosis is made—or should it be delayed until such time as the infection is fully established and possibly localized?

The subject of the etiology is very fully discussed in a paper by W. Obadalek.¹ He has carried out a number of experiments with a view to elucidating the methods and routes of infection, but no fresh light has been thrown upon the question; in fact, it may be said that the matter is now as fully established as it is likely to be. The evidence indicates that there is a local avenue of infection which varies in different cases, the female genital tract, the respiratory tract, including the tonsils and nasopharynx, and the intestinal tract. From the local focus a general infection arises, a condition virtually of septicaemia, and the peritonitis is but a tissue reaction to the general infection. If this conception is correct—and there is much in support of the view—it is evident how profoundly it must affect our ideas of treatment. The suggestion that the peritoneal area, as representing a mesothelial space, has peculiar properties of reaction in response to conditions of general infection is put forward by John Fraser.² He describes the evolution of the peritoneal space, indicating that it originally developed as a protective space around the dangerous infective area of the intestinal tube. It is within the confines of the primitive peritoneal space that the group of elementary leucocytes first makes its appearance, and it appears evident that from the phylogenetic point of view the peritoneal space was originally intended as an area of protection. From observation of cases of so-called idiopathic peritonitis, i.e., cases in which no intraperitoneal focus of infection can be demonstrated, he believes that the peritonitis which develops under such conditions is a peritoneal (mesothelial) reaction secondary to the general disturbance. In this event the peritonitis is in some respects a salutary feature in so far as it affords possibilities of an immunity influence. It is on some such basis that the development of pneumococcal peritonitis is explained—a peritoneal reaction secondary to a pneumococcal septicaemia. In this connection A. Bréchet and Nové-Jossrand³ point out that the type of pneumococcus has some influence in relation to the local development, for it is the Type I which is likely to be associated with peritonitis, while Types II and III are encountered in pneumonia.

The pathology of the disease is discussed by the same authors,⁴ and it would seem that the peritoneal disturbance is probably a general one from the beginning, a congestion of the serous surface being followed by the production of a curious mucus-like effusion. It is comparatively late before the stage of purulency is reached, and it is unusual for the purulent effusion to be in any degree copious.

TREATMENT.—These facts are not much in dispute—it is rather on the question of treatment that opinion is divided. The majority of French and German writers appear to be satisfied that operative interference should be delayed until such time as the infection is sufficiently established and localized, a phase which is reached about the twelfth or fourteenth day. When interference is indicated it is sufficient to limit it to a small drainage incision in the suprapubic or right iliac fossa. The advocates of delay point to the high mortality of the early operation, and they very rightly claim that to open the abdomen at the early stage of the disease achieves no advantage, because there is no condition existing which demands or is likely to be benefited by drainage. All are agreed, however, that delay sometimes raises embarrassment in case the

peritonitis of an appendicitis is confused with the pneumococcal infection, and for this reason the compromise is made of obtaining by abdominal puncture or by a more deliberate incision a sufficiency of the peritoneal effusion to afford bacteriological confirmation of the diagnosis. This at least is clear—the late operation is becoming increasingly the procedure of choice in the majority of Continental clinics. Such a state of affairs is particularly interesting in view of the contrary opinion expressed at the recent meeting of the British Medical Association in London (Children's Section). The striking success of the late operation is recorded in papers by M. Guillioud⁵ and by G. Wok'sohn.⁶

It is remarkable that the various recent contributions to the discussion of the treatment of pneumococcal peritonitis make little or no allusion to the value of **Serum Treatment**. In the reviewer's opinion this is one of the most valuable adjuncts of treatment, and to secure the maximum of benefit the serum should be administered in large doses (50 c.c.) of the appropriate type (generally Type I) by the intravenous route.

REFERENCES.—¹*Deut. Zeits. f. Chir.*, 1931, Nov., 587; ²*Brit. Med. Jour.* 1931, ii, 47; ³*Jour. de Chir.* 1931, xxxviii, 533; ⁴*Presse méd.* 1931, Oct. 14, 1505; ⁵*Lyon Chir.* 1931, Sept. and Oct., 580; ⁶*Zentralb. f. Chir.* 1932, Jan. 23, 209.

PERNICIOUS ANÆMIA. (See ANÆMIA, PERNICIOUS; MENTAL DISEASE AND PERNICIOUS ANÆMIA.)

PERTUSSIS. (See WHOOPING-COUGH.)

PHARMACOLOGY AND THERAPEUTICS. (See also BRITISH PHARMACOPŒIA, 1932.)

Ivor J. Davies, M.D., F.R.C.P.

Alcohol.—T. Leary¹ (Boston) writes on the therapeutic value of alcohol. He paid special consideration to the relations of alcohol to cholesterol and thus to diabetes, arteriosclerosis, and gall-stones. The following summary is drawn from his paper. The lack of evidence that alcohol is the specific cause of any disease processes, other than those due to its effect upon the tissues of the central nervous system, is given attention. The harmful results of its abuse are emphasized. It would appear that alcohol has potential value as a food in diabetes, and can be used in non-toxic doses to supplement the limited diet, and to furnish energy for more active living. Its addition to a diet beyond the caloric tolerance of the individual should be guarded against. Its use as a drug to overcome harmful inhibitions, its limitations, its euphorogenic properties, and its particular application to the cardiovascular conditions of the descending period of life are considered. Its value as a potential solvent of cholesterol, its possible influence in preventing the deposit of cholesterol in the form of gall-stones, and in delaying the advent of atherosclerosis are discussed. In febrile conditions Leary refers to Ringer's excellent rule, "If, after the use of alcohol, we see the pulse become slower, the skin and tongue moister, sleep better, nervous symptoms less marked, breathing less hurried, food better taken—the alcohol is doing good. *Not otherwise.*" (See also ALCOHOL AND DRUG ADDICTION.)

Bismuth Salts.—H. N. Cole² and collaborators report on the presence of uneven quantities of bismuth in oily bulk suspensions of its salts. Other things being equal, soluble solutions of bismuth salts will allow of more exact dosage. If a more exact dosage is important, it could perhaps be secured by the use of a mechanical mixer.

(See also SKIN DISEASES, BISMUTH THERAPY IN; SYPHILIS.)

Convalescents, Treatment of.—Lieut.-Colonel J. Cunningham³ writes on the convalescent state and describes its management at the Astley Ainslie Institution. This institution was founded through the bequest of the late

Mr. David Ainslie, of Costerton, "for the behoof of the convalescents of the Royal Infirmary, Edinburgh". Excellent results have already been obtained in the restoration and rehabilitation of convalescents. Their care received a great impetus in the late war, and the experience gained at this time seems to have established the value of certain measures which fall under special headings: The treatment of convalescents in separate establishments specially designed and equipped for this type of case; the provision of special institutions for special diseases—cardiac, nervous, orthopaedic, etc., where specialized treatment can be concentrated; the importance of continuing active treatment for a sufficient length of time to permit of full recovery; and the importance of graded occupation and recreation, both mental and physical, as a factor in bringing about an ultimate return to health.

The governors decided that one of the main functions of the Astley Ainslie Institution should be the care of those individuals who required a prolonged convalescence in the hope that, if sufficient time were given, their recovery would become assured and they would thus be prevented from the possibility of falling into a condition of chronic invalidism. A novel feature in preventive convalescent treatment was introduced by the inclusion of special types of patients who were in a poor state of health, and who required building up *before* undergoing an operation designed to restore them to health.

The types of case in whom the benefit received has been most marked may be summarized as follows: (1) Tuberculous cases, especially those who have stayed for a really prolonged period; (2) Cases recovering from certain respiratory conditions, such as pneumonia, pleurisy, and empyema, especially where such cases have followed upon a history of debility; (3) Cases of convalescence from septic infection, especially some forms of puerperal sepsis; (4) Cases of anæmia and debility; (5) Cases following operation for middle-car disease, especially in the case of children; (6) A proportion of adolescent heart cases.

The great importance of the care of the convalescent needs no emphasis. The extension of such facilities is an urgent necessity, especially in industrial areas. Neurasthenias and anxiety neuroses and even general physical disabilities too often result under the present haphazard management of the convalescent.

Ephedrine.—W. W. Fray⁴ (Rochester, N.Y.) has studied the effect of ephedrine upon the human stomach⁴ roentgenologically. Ephedrine commonly produced a diminution in peristalsis and tone in the normal stomach, but in relaxing spasm the action of ephedrine was more variable and often failed. The latter result was more marked in the presence of local disease. Ephedrine has much the same objective result as atropine. Neither of these drugs should be accepted as a specific diagnostic agent in the differentiation of intrinsic and extrinsic lesions. Both may relax spasm in the presence of local organic disease or may fail to relax spasm of a reflex or functional character. These drugs were not effective in the relaxation of cardiospasm, and their action in cases of pylorospasm was variable.

Eucortone.—T. Thompson and B. F. Russell⁵ (London) report a case of *Addison's disease* successfully treated with cortical suprarenal extract. The case was so severe that death appeared to be imminent. The response to cortical hormone in crisis is dramatic, but treatment must be continued indefinitely in most cases. The extract used in the case recorded was Eucortone, a product of Allen and Hanburys Ltd.

Local Antisepsis.—E. Saleeby and M. J. Harkins⁶ (Philadelphia) made a comparative study of antiseptics in experimentally produced local infections. Local abscesses were produced in guinea-pigs with *Staphylococcus aureus*. The comparative efficiency of several popular antiseptics was determined by daily

local application after the removal of crust and pus from the abscesses. The experiment was repeated three times with the same technique. Their results were uniformly in favour of *mercuraphen* (1 and 2 per cent) solution. The other three in the order of their efficiency were *metaphen* (1-500 solution), *tincture of iodine*, and *mercurochrome* (2 per cent) *aqueous solution*. Some of the antiseptics used delayed the healing process, as is shown by comparing with the untreated animals. *Tincture of iodine* appeared to be too irritating for the tissues, and unless used with caution is harmful.

Although the local application of some of these antiseptics was of value, the authors believe the mechanical cleansing and free drainage of the wound are more important factors in the healing process than the mere application of antiseptic solutions to already infected wounds.

Brilliant Green.—J. K. Narat⁷ (Chicago) has made a clinical study of the value of brilliant green as a local antiseptic. Brilliant green chemically is a diamino-triphenylmethane compound. The product is a green powder, soluble in water and alcohol; the aqueous solution is not stable and should be freshly prepared; it has been used by Narat only for warm baths and compresses. Otherwise a 1 per cent solution in 60 per cent alcohol was used in all the cases except mucous membranes, where 0.5 per cent solution seemed to be more advisable. The stains on hands can be removed by vigorous rubbing with alcohol or hydrogen peroxide; the latter can be used to remove stains from soiled linen, but usually the ordinary washing processes are sufficient.

A survey of the clinical results after the use of brilliant green as a local antiseptic in prophylaxis as well as treatment of various surgical conditions shows that the substance possesses a high antiseptic value toward the most frequent pathogenic micro-organisms encountered in surgical diseases; it has an excellent power of penetration; it is non-irritant and non-toxic; it stimulates the formation of healthy granulation tissue; and last, but not least, it is very cheap. The impression was gained that in many instances the substance was superior to other antiseptics in common use. These findings justify further clinical investigations as to the value of brilliant green, and suggest the desirability of laboratory experiments in order to evaluate it as a general antiseptic.

Lycopodium.—T. G. Stonham⁸ (London) writes on the therapeutic uses of *Lycopodium clavatum*. The spores are exceedingly hard and are insoluble in water and alcohol. It is possible, however, to make a tincture with ether. Vigorous and prolonged trituration of the spores is required. The effects of experiments were mainly shown in the gastro-intestinal tract, and appeared to be an alteration of the secretion together with a disturbance of the intestinal neuromuscular apparatus. There results an error in metabolism which is the source of the more remote widespread symptoms caused by the drug.

In the same way no patient would have every one of these symptoms, but if he has a sufficient number to show that his disease is exhibiting the same kind of departure from health, lycopodium can be given with confidence that it will restore the disturbed functions to their normal equilibrium.

The drug was used successfully in many affections where the symptoms corresponded with the effects of the drug used experimentally by the observer. The article was meant to illustrate the value of the homœopathic method of choosing a remedy, and the importance of minute subdivision by trituration in the development of medicinal power in what is apparently an inert substance.

Mustard Oil.—A practical article on the uses of mustard in medicine is contributed to the *Journal of the Medical Association of South Africa*.⁹ The article is confined to the action of the volatile oil of mustard (B.P. 1914), which is rapidly evolved when crushed black mustard seeds, or the flour obtained

therefrom, is moistened with cold or warm water, being formed by the interaction of an enzyme, myorisin, with an organic compound known as sinigrin. This enzyme, like others, is destroyed by heat, so that when mustard is added to hot water no volatile oil is formed. Thus in taking a hot mustard bath the mustard should be mixed with *tepid* water five minutes before being added to the bath. The numerous applications of 'mustard therapy' need not be described, but the above-mentioned practical suggestion must be borne in mind to obtain the best results from this old time-honoured remedy.

Oxygen and Carbon-dioxide Therapy.—In a discussion on the therapeutic administration of oxygen and carbon dioxide at the Royal Society of Medicine,¹⁰ Professor J. S. Haldane described the physiological effects of adding oxygen or carbon dioxide to the inspired air under different conditions. He referred to various clinical conditions, such as bad cases of pneumonia or shock, in which the breathing becomes very shallow, or the distribution of air among the alveoli becomes irregular from mechanical reasons, and dangerous anoxæmia arises in this way accompanied by cyanosis, which is prevented when some oxygen is added continuously to the inspired air so that the available alveoli receive sufficient oxygen.

The therapeutic administration of carbon dioxide is more recent than that of oxygen. It was first introduced generally by Yandell Henderson in the treatment of carbon-monoxide poisoning in America, where cases are relatively frequent. Oxygen had hitherto been given in order to facilitate the expulsion of carbon monoxide from the blood, but it was found that when carbon dioxide was added to the oxygen the expulsion was greatly hastened owing to the increased breathing. Even if only air was used along with carbon dioxide, the expulsion was faster than with pure oxygen.

Henderson has more recently laid great stress on another influence of carbon dioxide. When, after carbon-monoxide poisoning, after serious operations, or under various other conditions the breathing is feeble, it is apt to happen that a bronchial tube becomes blocked. The effect of this is that the air in the corresponding part of the lung is absorbed and collapse ensues, which is liable to be followed by local pneumonia. This tendency is prevented by adding enough carbon dioxide to the inspired air to keep the depth of breathing normal. In newborn infants the expansion of the lungs is apt to be imperfect, followed by local pneumonia. The administration of carbon dioxide seems to be very useful in preventing this danger.

He stressed the importance of instructing nurses in the use of an apparatus whereby oxygen or carbon dioxide can be administered in definitely measured amounts, which can be varied at once according to the effects on the patient and which can be continued for days when necessary.

G. Crowden demonstrated the *Drinker respirator*, which had been developed in America for the administration of artificial respiration for long periods of time in severe cases of asphyxia or paralysis of the muscles of respiration. This apparatus is not designed for immediate first-aid in cases of gas poisoning, but for very severe cases which do not respond satisfactorily to the normal methods of artificial respiration or which require treatment for long periods. The machine has proved of particular value in cases of poliomyelitis in children in which paralysis of the respiratory muscles developed. A full description of the apparatus will be found under MEDICAL AND SURGICAL APPLIANCES.

E. P. Poulton stated that the ordinary nitrous-oxide-gas mask, with valves and a large balloon, was found most effective.

R. Hilton demonstrated a rubber cap to fit over the nose which could be used directly from an oxygen cylinder or from a Haldane-Davies water-valve if economy in oxygen was desired. For simplicity of use the nasal catheter

was unrivalled; the nose-cap was somewhat more efficient and was comfortable. The face-mask gave most oxygen to the lungs, but was not readily tolerated by patients suffering from pneumonia.

C. G. Douglas said that one difficulty which had to be faced by those who gave oxygen was lack of suitable apparatus. Obviously, the physician could not carry an oxygen chamber about with him, though he might carry round a Poulton oxygen tent. With Professor Haldane's apparatus he had during the War given oxygen continuously for three days to a case of pulmonary oedema resulting from phosgene poisoning.

A. J. D. Cameron¹¹ (London) asserts that oxygen therapy by the mouth is a powerful therapeutic measure whether used alone or as an adjunct to other measures. He has used these methods in many disorders of the digestive tract generally, and especially in cases where there was no evidence of any particular part being at fault, but where a poor absorption and assimilation of food were obvious. The latter cases were all of the under-weight, low-blood-pressure, easily-tired group—patients whose general metabolism was below par. The oxygen is actually eaten in the form of a fine foam which is made up of millions of little bubbles, each containing some of the gas. When ready for use it looks just like a fine soufflé. Two or more tablespoonfuls are eaten after each meal. The foam is not at all unpleasant, but if desired it can be flavoured with lemon or other fruit juice. The apparatus made by the Sandor foam firm provides an easy way of making up the oxygen soufflé.

A. L. Barach¹² (New York), describes an oxygen chamber which is simplified in design and operation over previous types of chambers. Improvements in the oxygen tent are described, and the dangers of increased temperatures and humidities in inadequately ventilated tents are emphasized. M. B. Rosenblüth and M. Block¹³ (New York) have treated 75 patients ill with lobar pneumonia in oxygen tents of either the Roth-Barach or the McDonald type. When they first used these tents they noted occasionally that even though the soda lime was not changed for periods somewhat longer than the prescribed forty-eight hours the patients appeared quite comfortable. It was then left unchanged for periods of about six to eight days and still the patients made no complaint. They concluded from their observations that soda lime is not necessary for the removal of carbon dioxide when large quantities of oxygen are used.

O. Parkes (London) and C. H. Buckley¹⁴ (Onchan, Isle of Man) report their results on treatment by *octozone*. Oxidation is the most vital process in the body metabolism, and disinfection depends largely upon it. For this reason the discovery by E. Royer, of Lyons, of a method of producing a new form of ozone which has safe and rapid powers of oxidation deserves consideration. The gas, which Royer has called *octozone*, is produced simply and quickly by passing oxygen at a pressure of about 5 lb. through an apparatus called the *electronizer*, in which it is subjected to the action of a silent electrical discharge. *Octozone* may be described as a very concentrated and exceedingly potent form of ozone. It is soluble in water, giving a practically tasteless solution. Stored in glass containers (blackened, or away from light) or aluminium bottles, it retains its properties for some days. Its use in treatment depends upon its rapid absorption by the body tissues. Although it is far too pungent to be inhaled, it is harmless when applied properly, either externally or internally, and several methods are employed for treatment purposes. Local baths, spraying, and injections of the gas have a rapid action on wounds and ulcers, and the deep injections down over the hip-joint and on to the sciatic nerve have given excellent results in cases of arthritis and sciatica.

(See also ANÆSTHESIA; LUNG, POST-OPERATIVE MASSIVE COLLAPSE OF; PNEUMONIA; RESUSCITATION FROM ASPHYXIA.)

Phenolphthalein.—L. F. Bender¹⁵ (Philadelphia) recommends phenolphthalein in chewing-gum in small dosage ($\frac{1}{4}$ gr.) as an effective, non-gripping, non-habit-forming laxative for children. Phenolphthalein dissolves in an alkaline medium, and it seems not unlikely that the admixture of alkaline saliva obtained during the chewing process has a considerable bearing on this increased activity.

Physiotherapy.—H. D. Storms¹⁶ (Toronto) discusses the indications for physiotherapy. The following physical agents and their principal uses were thus described :—

Massage.—Relieves muscle spasm, stimulates blood and lymph circulation, and relieves pain.

Diathermy.—In producing deep heat, relieves pain and inhibits the growth of infecting organisms; and, in stimulating the circulation or in increasing the collateral circulation, it brings a normal amount of blood to a part that is anæmic.

Ultra-violet Rays.—Can be used for raising resistance to infection and for the reorganization and sterilization of tissue in skin lesions.

Wave Currents.—Stimulate weakened muscle either striped or unstriped.

Active Exercise.—Will build up weakened muscle.

Passive-Exercise.—Will stretch or break down adhesions, and, if the patient will not move the joint, it is the best way that function can hope to be restored.

This contribution clearly shows that many common painful affections can be quickly relieved by suitable physiotherapeutic measures, whilst the cure, such as the removal of a source of infection, can be dealt with later.

J. S. Coulter¹⁷ (Chicago) surveys some of the clinical applications of *medical diathermy*. It is possible to produce deeper heat with this agent than with any other form of heat. The circulation of the blood prevents the temperature of the body tissues traversed by the current from becoming very high. However, the active hyperæmia resulting from medical diathermy causes beneficial physiological effects, concerning which further scientific investigation is needed. Some recent uses in vascular disturbances of the extremities and in the production of artificial fever promise valuable therapeutic results. The contra-indications to its use are also described.

Proctoclysis.—G. L. Perusse¹⁸ (Chicago) has investigated the solution of choice in proctoclysis through experimental work on dogs and on man. He concludes that the rôle of proctoclysis is in the establishment and maintenance of water balance in selected cases where it is impossible or inadvisable to administer fluids by mouth. It is used rather than hypodermoclysis or intravenous infusion in any but acute conditions and in conjunction with those methods in the latter. It is his contention that such administration of fluid is thoroughly adequate and physiological: 1 per cent *Glucose Solution* is the most efficient proctoclyster of those studied in this series. It may be combined with 0.5 per cent *Sodium Bicarbonate* with a somewhat lowered rate of absorption but a possible greater effect in combating acidosis. Of the inorganic salts studied, 0.5 per cent sodium bicarbonate solutions were superior to others in rate of absorption. Isotonicity is not the ideal concentration for a given solution, for by maintaining such a concentration we are neglecting one of the best properties of the gut—its action as a semi-permeable membrane. Hence if we introduce a solution definitely hypotonic to the blood, it is more readily absorbed, following the laws of osmosis. In regard to the glucose solutions, we may consider that the selective activity of the gut cells comes into play.

E. L. Scott and J. F. B. Zweighaft¹⁹ (New York) have studied the blood-sugar in man following the rectal administration of dextrose. The dextrose retention enema is such a common clinical procedure, and the impression that considerable amounts of dextrose are absorbed after rectal administration is

so well established in spite of the conflicting nature of the experimental data submitted in evidence, that they consider the problem worthy of further investigation. Their subjects were 50 healthy medical students. They concluded that it was not possible to demonstrate a rise in the blood-sugar curve as a result of administering dextrose in retention enemas, that the slight drop that their curves show may be due to a stimulation of pancreatic activity brought about by the absorption of a slight amount of dextrose, or, more probably, to chance variation, and that a variable and frequently considerable amount of dextrose administered by enema may be recovered from the stools after two and a half hours.

Protein Therapy.—P. S. Hench²⁰ (Rochester) has studied the reactions to injections of foreign protein (**Typhoid Vaccine** intravenously) at the Mayo Clinic in a group of about 2500 patients and an aggregate of about 10,000 injections. Of these patients, approximately 1500 had arthritis; the remainder suffered from various conditions, chiefly vascular disease. The reactions were in general well borne, and the beneficial results from protein therapy justify, in certain diseases at least, its continued use and further development.

Unusual reactions were rare, and occurred in only 14 of his cases, an incidence of about 0.5 per cent of the patients, and were as follows: acute and subacute appendicitis, cholecystitis, enteritis, pleurisy, pericarditis, iritis, glaucoma, adenitis, extensive vascular thrombosis, and renal insufficiency. In arterio-sclerotic vascular disease acute thrombosis is the occasional possibility. In arthritis and other diseases the reactions are variable. It is believed that these reactions are not incidental complications but are related to protein therapy in the presence of an underlying disease.

Death occurred in 3 instances, a mortality rate of 0.12 per cent. This constitutes a very small risk, but a risk that must be recognized and that can possibly be avoided by the most careful selection of patients.

Unsuspected latent or quiescent focal inflammation and infection may be stimulated. Except in certain conditions, of which pulmonary tuberculosis is one, the known presence of latent or quiescent foci should not act as a contra-indication to such treatment. Indeed, part of the value of such treatment lies in the possible demonstration of suspected or unsuspected foci otherwise undemonstrable at the time. Such reactions, if their significance is appreciated, may be advantageous rather than detrimental.

The mechanism of the usual and unusual reactions can be understood, in part at least, from a study of the various reported components of the reactions.

The prevention, recognition, and treatment of such reactions were considered. The recognition that such reactions may occur has led to a more careful selection of patients and a more judicious use of protein therapy.

E. Bonime²¹ (New York) discusses immunotherapy in its non-specific phases. Non-specific protein reaction produces the therapeutic effect by stimulating the specific immune response to most bacteria producing one or more foci of infection in the body. It is particularly indicated where the foci of infection cannot be reached for culture for autogenous vaccine, where the infection has lasted so long that the specific response is no longer sufficient for a cure, and where changes in structure prevent sufficient circulation; the lighting up of the infection during the non-specific reaction reactivates the healing mechanism. It is contra-indicated in all forms of allergy and anaphylactic conditions; in very low blood-pressure, decompensated heart lesions, acute organic kidney lesions, and alcoholism; and in all forms of tuberculosis. A tuberculin test should be made when tuberculosis is suspected.

The reactions are harmless when these few contra-indications are excluded. Bonime used **T.A.B. Vaccine**, beginning with a dose of 5,000,000 in children

and 15,000,000 to 25,000,000 in adults, intravenously. The intervals should be from two to four days, depending upon the effect of the shock on the kidneys. The urine must be examined for red blood-cells on the following day. The author continues the injections as a rule at regular intervals without increasing the dosage, until it ceases to produce a shock. He then allows an interval of ten days to three weeks before a new course is given until the end of the treatment.

Spa Treatment.—R. Fortescue Fox²² (London) contributes a practical article on "The British Spas: Indications and Seasons." These spas as a group are the most invigorating in Europe. The ailments and disorders that are treated with most benefit belong mainly to the great category of the *disorders of middle life*. In practice, a 'spa cure' for busy people can often be combined with the annual holiday. The British spas are of great value for many forms of 'break-down', provided that the diagnosis is made and treatment instituted in the early stage of defective or exaggerated function.

M. B. Ray²³ (London) writes on the choice of a spa. Some scheme of classification of the various spas in this country is essential, so that by a comparison of the facilities available a satisfactory selection may be made with due regard to the requirements of the particular case in view. From the prescriber's point of view, probably the most convenient basis for classification is that of their medicinal properties.

The two foregoing articles describe the character of the waters and therapeutic indications, and will enable a practitioner to make a proper selection of a spa and to take an intelligent interest in the progress of the case.

Squills.—The employment of squills as a remedial agent is as old almost as medicine itself. It is one of the numerous drugs referred to in the famous *Papyrus Ebers*, which dates about B.C. 1550; Pythagoras is said to have introduced the oxymel of squill in the sixth century B.C., and the drug is mentioned, chiefly for its diuretic action, by many ancient and mediæval writers.

That squill owes its action to the presence of glucosides has long been recognized, but much confusion has existed regarding their nature and composition. In 1921 Stoll and Suter isolated a principle which they called 'scillaren', and which appears to represent the total glucosides of the drug, and to have an action comparable to that of squill itself. More recently the same workers²⁴ were able to split this into two components—scillaren-A (crystalline and insoluble in water) and scillaren-B (amorphous and water-soluble), in the relative proportions of three of A to one of B. Two preparations are now on the market (Sandoz Chemical Works), namely, **Scillaren**,* which represents the total glucosides, and **Scillaren-B**,* which represents the water-soluble portion only.

The action of scillaren is similar to that of digitalis, but it is practically non-cumulative and is therefore better suited for prolonged administration. Scillaren-B is intended for intravenous use when immediate action is imperative.

D. V. Branisteanu²⁵ (Paris) reports on the therapeutic action of scillaren. It is indicated in valvular lesions, cardio-renal sclerosis, pulmonary emphysema, and chronic myocarditis. It is without influence in cases of cardiac insufficiency with arrhythmia, auricular fibrillation, and extra-systolic arrhythmia. In therapeutic doses it does not increase the arterial tension.

Sulfosin.—T. D. Power²⁶ (Brentwood, Essex) showed by animal experiments that sulfosin is a powerful leucoblastic stimulant and the leucocytes exhibited a high degree of phagocytic activity. Sulfosin is the trade name given to a preparation consisting of a 1 per cent suspension of sulphur in oil. Injections of sulphur oil have been widely employed of late in the treatment of a variety

* Brooks & Warburton Ltd., 232, Vauxhall Bridge Road, London, S.W. 1.

of conditions, such as general paralysis of the insane and dementia præcox. The primary object of the therapy is to produce a series of pyrexial bouts, and any good results are usually attributed to the fever.

Tryparsamide.—J. P. Steel²⁷ (Middlesbrough) has found that provided tryparsamide is given under proper care and supervision it is of very definite use for its tonic effect, and also for its benefit in the neurosyphilitic conditions. Its effects are both tonic and ameliorative, and although particularly useful in tropical diseases, it has been used extensively in other spirochætal conditions with success, whilst it has given results in other nervous conditions by reason of its tonic properties.

Urinary Antiseptics.—J. M. Johnston²⁸ (Glasgow) reviews the pharmacology of urinary antiseptics. The term 'urinary antiseptic' is commonly applied to a drug which is given internally to exert an antiseptic effect on the urine and which itself is excreted by the kidney. A study of the literature shows that the reputation of most urinary antiseptics is founded upon a rather empirical use or upon unsound scientific principles. It is useless to expect cleansing of the urinary tract until any source of infection is located and eradicated. The ideal urinary antiseptic should be rapidly absorbed and excreted, and should have no irritant action on the gastro-intestinal tract, the liver, or the kidney. It has been generally recognized that the question of urinary antiseptics is closely connected with the reaction of the urine. Rendering the urine acid prevents the growth of urea-splitting micro-organisms and tends to be unfavourable to cocci. **Ammonium Benzoate** and **Ammonium Phosphate** are efficient urinary acidifiers tending to establish the pH at a level of 5.5 to 6.0 (7.0 being neutral point).

The evidence suggests that the known clinical results following the combination of hexamine with ammonium benzoate or phosphate depend upon: (1) The diuresis produced affording mechanical cleansing; (2) The formation of acid urine, unfavourable to bacterial growth and liberating formaldehyde; and (3) The inhibitory effect of the free formaldehyde upon the causal micro-organism.

J. M. Scott and D. R. Mitchell²⁹ (Toronto) submit a preliminary report of a clinical study of urinary acidifiers and antiseptics. They conclude that the success achieved in some of these cases of known history and long standing justifies them in suggesting that **Ammonium Chloride** or other urinary acidifiers of more effectiveness than acid sodium phosphate or even ammonium benzoate might well be given a trial in cases of urinary infection, when it is the intention to give hexamine. Ammonium chloride was given in doses of 20 gr. four times daily in a mixture with 10 gr. of **Hexamine**.

J. M. Scott³⁰ (Toronto) discusses the value of **Ammonium Phosphate** as a urinary acidifier. This drug gives apparently as marked an acidity in the urine as ammonium chloride, and is more pleasant to take in large doses, such as 20 gr. four times a day. Unfortunately, it cannot be combined with hexamine, as formaldehyde is set free.

REFERENCES.—¹*New Eng. Jour. Med.* 1931, July 30, 231; ²*Arch. Dermatol. and Syph.* 1931, Nov., 739; ³*Edin. Med. Jour.* 1931, Sept., 137; ⁴*Amer. Jour. Med. Sci.* 1931, Sept., 387; ⁵*Lancet*, 1932, ii, 178; ⁶*Ann. of Surg.* 1932, Feb., 249; ⁷*Ibid.* 1931, Dec., 1007; ⁸*Med. Press and Circ.* 1931, Dec. 2, 436; ⁹*Jour. Med. Assoc. of S. Africa*, 1931, Sept., 591; ¹⁰*Proc. Roy. Soc. Med.* 1932, March, 621; ¹¹*Med. Jour. and Record*, 1931, Nov. 4, 427; ¹²*Jour. Amer. Med. Assoc.* 1931, Aug. 8, 390; ¹³*Ibid.* 1932, Jan. 30, 396; ¹⁴*Lancet*, 1931, ii, 849; ¹⁵*Med. Jour. and Record*, 1932, Jan. 20, 87; ¹⁶*Canad. Lancet and Pract.* 1932, May, 143; ¹⁷*Jour. Amer. Med. Assoc.* 1932, June 4, 1987; ¹⁸*Surg. Gynecol. and Obst.* 1932, May, 770; ¹⁹*Arch. of Internal Med.* 1932, Feb., 221; ²⁰*Ibid.* Jan., 1; ²¹*Med. Jour. and Record*, 1932, Jan. 20, 53; ²²*Practitioner*, 1932, April, 373; ²³*Ibid.* 382; ²⁴*Prescriber*, 1931, Nov., 387; ²⁵*Presse méd.* 1929, Sept. 7, 1170; ²⁶*Lancet*, 1932, i, 338; ²⁷*Practitioner*, 1931, Oct., 484; ²⁸*Lancet*, 1932, i, 54; ²⁹*Canad. Med. Assoc. Jour.* 1931, Dec., 668; ³⁰*Ibid.*, 666.

PHARMACOPŒIA, BRITISH, 1932. (See BRITISH PHARMACOPŒIA, 1932.)

PHARYNGITIS, PSEUDOMEMBRANOUS PNEUMOCOCCAL.

F. W. Walkyn-Thomas, F.R.C.S.

De W. G. Richey¹ describes a series of five cases of pseudomembranous pneumococcal pharyngitis treated with **Ethylhydrocupreine Hydrochloride**. All the patients were adults, and all except one were in good health prior to the attack. This one patient, who was 80 years old and had advanced arteriosclerosis, was the only one who died.

The onset is usually rapid, with fever, sore throat, dysphagia, and lymphadenitis. In these cases the tongue was never affected, and the presence or absence of the tonsils had no effect. The 'membrane' closely resembles that of diphtheria, but bacteriological examination of a piece of the exudate, which must be taken from the advancing edge, shows pneumococci. In all these cases the organisms were of Group IV.

Richey, knowing how resistant the condition has proved to the usual methods of treatment, tried painting with a 1 or 2 per cent aqueous solution of ethylhydrocupreine hydrochloride ('optochin'), an alkaloid of the quinine group which has been proved to have a powerful germicidal action on pneumococci elsewhere (e.g., in conjunctivitis and empyema). In one case the application was painful and the pharynx had to be sprayed with cocaine; in all the others the application was painless itself and gave almost immediate relief to the pain of the condition. No toxic symptoms were noted in any case, although the paint was sometimes used two-hourly.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1932, Feb. 27, 730.

PHARYNX, CANCER OF. (See AIR-PASSAGES, ETC., MALIGNANT DISEASE OF.)

PHYSIOTHERAPY. (See PHARMACOLOGY AND THERAPEUTICS.)

PILES. (See HÆMORRHOIDS.)

PILONIDAL SINUSES.

*Sir W. I. de C. Wheeler,
F.R.C.S.I.*

F. H. Lahey¹ defines a pilonidal sinus as a developmental lesion, a skin-lined cyst, located between the buttocks over the sacrum; frequently it contains hair and frequently becomes infected. To ensure against recurrence, it is necessary to remove the entire sinus tract by a wide block dissection (Fig. 59). All extensions of the sinuses, laterally and subcutaneously down to the fibres of the *gluteus maximus* on either side of the sacrum, must be dissected.

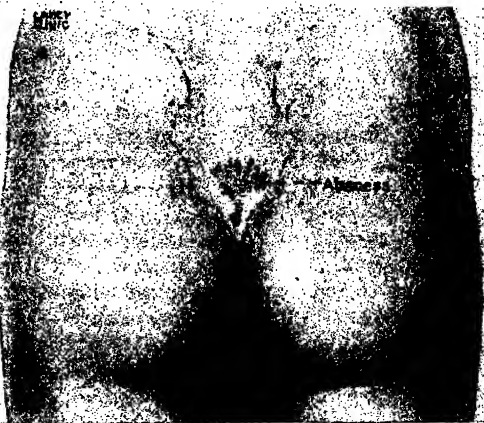


Fig. 59.—Diagrammatic drawing showing the location of the opening of a pilonidal sinus. The shaded area indicates the extent of involvement by an abscess which may be associated with the sinus. The necessity for wide block dissection of these tracks to avoid leaving portions of the track and to prevent recurrence is evident. (By kind permission of 'Surgery, Gynecology and Obstetrics'.)

R. B. Cattell and L. W. Stoller² discuss the subject of pilonidal cysts and sinuses and the extent of the operation necessary for their extirpation. Fifty-nine patients with pilonidal sinus are reported, together with the end-results of treatment in forty. Recurrence after operation was very common. The operation should consist of complete excision of a block of skin and fat together with all of the sinus tract. In the authors' experience, the utilization of a large pedicle flap to fill the defect has reduced the number of recurrences and reduced the time of healing.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1932, March, 521; ²*New Eng. Jour. Med.* 1932, Jan. 21, 110.

PITUITARY BODY, DISORDERS OF. (See also OSSIFICATION, DISEASES DUE TO ERRORS OF—HYPOPHYSIAL DYSDYSTOSIS.)

W. Langdon Brown, M.D., F.R.C.P.

CUSHING'S SYNDROME.

During the past year interest in the pituitary body has chiefly centred round Cushing's¹ description of a syndrome which he has termed 'pituitary basophilism'.

Without in any way detracting from the merit of this most admirable account, it may be pointed out that the association between basophilic adenomata and virilism with obesity in women has been noted for some years. F. Parkes Weber² reported an instance in 1926. The reviewer had the opportunity of seeing this case and urged that the basophilic adenoma was of significance. But it was not until H. M. Evans and M. B. Simpson in 1928 (see MEDICAL ANNUAL, 1930, p. 413) isolated a sex hormone from the basophil cells that the mind of the profession was prepared to accept the idea that an adenoma of such cells could produce such profound changes throughout the body, the less so probably because adrenal virilism was already clearly recognized. In Cushing's masterly account the gradual awakening to the realization of this syndrome is graphically recorded.

Pituitary adenomata are of three principal varieties—neutrophil or chromophobe (producing Fröhlich's syndrome), acidophil (producing gigantism or acromegaly), and basophil (producing the syndrome now to be described). A polyglandular syndrome, hitherto supposed to be of cortico-adrenal origin, characterized in its full-blown state by acute plethoric adiposity, by genital dystrophy, by osteoporosis, hirsuties of the male type, vascular hypertension, and polycythemia, has been found at autopsy in six out of eight instances to be associated with a pituitary adenoma. In the three most carefully studied cases this has been definitely shown to be composed of basophilic elements, the lesion in one case having been predicted during life. Ecchymoses on the legs and large red cutaneous striæ commonly occur, and glycosuria is not uncommon, apparently due to pancreatic fibrosis. Although most of the cases described have been in women, Cushing has collected examples of the syndrome in men, in two of which the presence of a basophilic adenoma was verified. As Cushing remarks, the hirsuties which gives such a bizarre appearance to the female patients does not attract attention in the men. The reviewer has seen instances in men, in one of which an adrenal origin was held so strongly by another physician that an exploration was performed but a normal appearance of the adrenals was revealed. As in Parkes Weber's case the patient died some six months later of acute pulmonary oedema.

One of Cushing's male patients with marked glycosuria as a complication was apparently entirely relieved of his pituitary symptoms by X-ray treatment.

SIMMONDS' DISEASE.

This condition, characterized by premature senility, and associated with damage to the anterior lobe of the pituitary, has already been referred to (MEDICAL ANNUAL, 1930, p. 414). R. M. Calder³ has reviewed the whole subject, collecting 70 cases from the literature. He calls attention to the emaciation and changes in the integument and teeth resembling those of old age, and the general slowing-down of all bodily processes. In connection with the slowing he reminds us that hibernation has long been considered to be under the control of the pituitary. Women provided 47 of his collected cases, and 20 of these were associated with pregnancy. Simmonds believed that emboli were responsible for the pituitary damage, but Reye⁴ disagrees with this. He calls attention to the well-known fact that during pregnancy the anterior lobe hypertrophies, and undergoes involution after delivery. He believes that in such an involuting organ the stage is set for the development of thromboses. Tumours or cysts were apparently the cause in 9 of the cases. Calder stresses the accompanying 'splanchnomikrie', regressive changes in all the abdominal viscera, contrasting them with the splanchnomegaly which accompanies over-functioning of the gland. Benefits have been recorded from the administration of **Anterior Lobe Extracts** in some instances.

THE HORMONES OF THE ANTERIOR LOBE.

The tendency to multiply the number of hormones existing in the anterior lobe has produced a reaction; a reaction which seems to have gone too far. Thus Remy Collin, of Nancy, regards the chromophobe, the eosinophil, and the basophil cells merely as different stages in activity of the same original cell. B. Zondek⁶ goes so far as to state that no relationship between the cell forms of the anterior lobe of the pituitary on the one hand and its various hormones on the other can be demonstrated. As far as the eosinophilic growth hormone is concerned, it is difficult to accept this view. Giant rats have resulted from injections of an acid extract of the eosinophil cells (Evans), and analogous results have been obtained in dogs by Teel, Putnam, and Cushing. The eosinophilic character of the adenoma in acromegaly has been repeatedly demonstrated. With regard to the sex hormone the position is certainly more difficult. As mentioned in the MEDICAL ANNUAL for 1932 (p. 364) ten different functions have been ascribed to the anterior pituitary in addition to the influence on growth. It is unlikely that these are carried out by ten different hormones. However, the strongest case for separate hormones is that for a separate œstrin-stimulating (Prolan A or Rho 1) and luteinizing (Prolan B or Rho 2) hormone. But even here Zondek is sceptical and is inclined to attribute the different reactions merely to quantitative differences. The difficulty in investigating this subject is greatly increased by the rapid passage of the secretion into the general circulation. Thus, though the gland itself at any time only contains 100-160 units of Prolan A and 23-50 units of Prolan B, a litre of pregnant urine may contain as much as 10,000 units. This must imply a very high degree of secretory activity, but it does not facilitate the determination of the source of that secretion.

T. N. A. Jeffcoate⁶ appears to have made a clear-cut distinction by showing that whereas Prolan A can be found in the urine at the menopause, after ovariectomy, and in some cases of malignant disease, Prolan B can only be found when the patient has living chorionic elements present in the body. A positive Aschheim-Zondek reaction has not been obtained except in the presence of such elements. The finding of Prolan A in the urine of patients with malignant disease has been almost entirely confined to those cases in which the

genital tract was the site of the neoplasm. He discusses four possible explanations: (1) That the growth itself actually manufactures the hormone. (2) That the growth may stimulate the pituitary to increased activity. (3) That the increased activity of the anterior pituitary is the cause and not the result of the malignancy. He quotes Susman's views (MEDICAL ANNUAL, 1932, p. 864), but points out that the hormone disappears from the urine quite rapidly after removal of the growth. (4) That the growth in the genitalia causes impulses to pass thence to the pituitary. On the whole he favours the last view, which would account most easily for Prolan A being excreted for the most part only when the genital tract is the site of the neoplasm.

There is some evidence for the existence of other separate hormones in the secretion of the anterior pituitary. The growth and sex factors are destroyed by boiling the extracts, while the one which acts both on the thyroid and on metamorphosis is not (C. G. Lambie and B. P. Wiesner⁷). According to Corner, ether destroys the lactigenous activity of anterior lobe extract, whereas no such effect on the other factors is reported.

THE PITUITARY AND POLYGLANDULAR SYNDROMES.

As long ago as 1912 Cushing maintained that the term 'polyglandular syndrome' implied nothing more than that secondary functional alterations occur in the endocrine series whenever one of the glands becomes primarily affected; and further that the term, as then employed, was restricted to those cases in which it was difficult to tell where the initial fault lay. Even then it was suspected, and it is now becoming clearer, that a primary derangement of the pituitary is particularly prone to cause widespread changes in other endocrine glands. The reviewer⁸ has called the pituitary 'the leader of the endocrine orchestra'. At the same time it must be recognized that the correlation between the adrenals and pituitary is so close that a very similar syndrome may be produced by either. Instances are to be found in the first two sections of this article, e.g., the close resemblance between pituitary basophilism and adrenal cortical overgrowth, and that between the premature senility induced by Simmonds' disease of the anterior pituitary and by adrenal atrophy. Then again, pineal tumours may produce many of the symptoms of adrenal cortical tumours, such as obesity and sexual precocity. Leyton has described a somewhat similar condition associated with thymic tumours, which is specially interesting in that both the pineal and thymus normally appear to act as retarding glands in regard to sexual maturity, herein being antagonistic to the anterior pituitary and the adrenals. The close connection between anencephaly and failure of the adrenals to complete their development must have some deep significance, for here there is a failure of both the central nervous system and these endocrine glands to evolve beyond the fish stage. This connection between glandular and nervous tissues is particularly well exemplified both by the adrenals and the pituitary. The long-drawn-out controversy as to the relative parts played by the diencephalon and the posterior pituitary in such conditions as diabetes insipidus, obesity, and hypogonadism should now be regarded as settled; either or both may be involved; it is sufficient that the relations between the two are disturbed. In this connection the recent description of a pituitary 'portal system' starting in the pituitary and ending in the tuber cinereum is of special interest (G. Popa and V. Fielding, quoted by G. Laroche and H. Simmonet⁹).

REFERENCES.—¹*Johns Hopkins Hosp. Bull.* 1932, March, 137; ²*Brit. Jour. Dermatol.* 1928, xxxviii, 1; ³*Johns Hopkins Hosp. Bull.* 1932, Feb., 87; ⁴*Munch. med. Woch.* 1928, lxxiii, 902; ⁵*Arch. f. Gynäk.* 1930, cxliv, 133; ⁶*Lancet*, 1932, i, 662; ⁷*Edin. Med. Jour.* 1931, Nov., 605; ⁸*Practitioner*, 1931, Dec., 614; ⁹*Presse méd.* 1932, May 4, 710.

PLAGUE.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

EPIDEMIOLOGY.—H. H. King and C. G. Pandit¹ summarize three years' investigations of the rat-flea distribution in about thirty local surveys in the Madras Presidency. The results confirm in a remarkable manner the theory of L. F. Hirst that the low incidence of plague in Ceylon, Madras, and other areas is related to the predominant prevalence of the *X. astia* flea, which is a poor carrier of plague as compared with *X. cheopis*. Thus a map of the incidence of plague in relation to flea prevalence in the Madras Presidency shows relatively high *X. cheopis* and plague incidence in the western areas around the endemic plague-infested Mysore plateau, and low plague with high *X. astia* incidence in the more low-lying easterly plain areas along the whole of the east coast of the province. These authors also note in the latter areas, in the absence or weakness of the south-west monsoon, that there is a more prolonged season with a mean temperature of 81° F. and over combined with a relative humidity below 76°, which are unfavourable to the prevalence of plague, in consequence of which the disease is not carried over from one plague season to the next. Evidence is also brought forward to show that *X. cheopis* fleas are liable to be introduced into places by the movements of cotton, and that in cotton mills, with their humid atmosphere, *X. cheopis* may be very prevalent, whereas, outside the cotton mills, few but *X. astia* fleas are found. The spread of plague may thus be assisted, and they think the *cheopis* flea is a comparatively recent introduction into Madras, with consequent wider prevalence of plague than in former epidemics. On the other hand, the *astia* flea has produced few and very small epidemics, which do not carry over the off-season.

TREATMENT.—What may prove to be an important advance in the **Serum Therapy** of plague has been recorded by B. P. P. Naidu, F. P. Mackie, and D. P. H. Brist,² working in the Bombay Haffkine Institute. Hitherto little benefit has been obtained from the serum treatment of this disease, so investigations have been carried out with a view to increasing its potency. For this purpose only highly virulent strains of plague bacilli, preferably derived from spleens, must be employed and their virulence maintained, as it is lost on prolonged cultivation without being passed through animals. Rabbits were found to produce a good serum for protecting the same species, and in sheep a serum was made which was found to be two and a half times as effective in the case of rats as the Pasteur Institute serum, but the mortality was high among the sheep and the yield of serum small. Calves of 300 lb. were therefore used and injected intravenously with virulent living plague bacilli, and on testing the calf serum in 1-c.c. doses on rabbits the mortality was only 20·7 per cent against 58 per cent with the Pasteur Institute serum; it was also found to have greater protective, antitoxic, and curative value than the Lister Institute serum. It was then tested in a small outbreak of plague in Hyderabad, Deccan, alternate cases being treated at first, and later two-thirds of the admissions. In 15 septicæmic cases the mortality was 73·3 per cent with the serum against 100 per cent in the controls; in bacteriologically positive cases without a severe degree of septicæmia 21 per cent of the serum and 50 per cent of the controls died; and in clinical cases not confirmed bacteriologically 9 serum cases all recovered and 2 of 8 controls died. The results were therefore distinctly better than in trials of other serums. The doses advised are 60 c.c. on admission, and 40 c.c. on the next day.

The comparative values of **Haffkine's Vaccine** and of **Anti-plague Bili-vaccine** have been tested by B. P. B. Naidu and R. G. Sathe.³ The latter is based on the researches of Besredka and was supplied in the form of tablets containing 50 mgrm. of heat-killed and desiccated plague bacilli which represent

60 to 70 billion organisms. Rabbits were used in the experiments, and the bile and vaccine pills were administered orally on three consecutive mornings and the Haffkine vaccine injected subcutaneously in a control series of animals, and the test dose of plague infection administered after seven or fourteen days. The bilivaccine was found to give no protection whatever and the Haffkine prophylactic gave 100 per cent protection, so the former is useless.

The **Bacteriophage Treatment** of plague is reported on by B. P. B. Naidu and C. R. Avari.⁴ Previous trials by others with bacteriophages obtained from d'Herelle have not given satisfactory results and the present trials also failed, although a bacteriophage isolated by d'Herelle's technique was obtained which dissolved a twenty-four-hour broth culture of *B. pestis* in less than two hours, proving that it was extremely active. Rats were used in the tests, and the bacteriophage was also given in addition to anti-plague serum, but this only resulted in lessening the curative value of the serum—apparently by increasing the toxæmia by dissolving the plague bacilli in the system. The bacteriophage was also used in thirty-three plague cases, both intravenously and by injection twice a day into the bubo, without any benefit. Germanin, Bayer 205, was also tried in plague cases by B. P. B. Naidu and R. G. Sathe,⁵ although even in a dilution of 1-20 it had no germicidal effect in twenty-four hours on the *B. pestis*, and in the largest tolerated dose the drug had no curative property against plague in rabbits.

REFERENCES.—¹*Ind. Med. Gaz.* 1931, Oct., 357; ²*Lancet*, 1931, ii, 893; ³*Ind. Med. Gaz.* 1932, April, 987; ⁴*Ibid.* Jan., 737; ⁵*Ibid.* 749.

PLEURISY. (See also EMPYEMA; PNEUMONIA.)

W. H. Wynn, M.D., F.R.C.P.

R. A. Young¹ gives the following classification of pleurisy:—

ACUTE: (1) Dry pleurisy; (2) Pleurisy with effusion—(a) serous, (b) sero-purulent, (c) purulent, (d) hæmorrhagic.

CHRONIC: (1) Chronic dry pleurisy; (2) Chronic effusions; (3) Chronic adhesive pleurisy.

Though useful, this classification is artificial, since most of these conditions are stages in a process of varying degrees of intensity, extent, and virulence. A diagnosis of pleurisy should not be regarded as sufficient without some qualification indicating the cause of the inflammatory condition. Treatment must depend upon the cause, the stage, the intensity, and the extent of the process.

Dry Pleurisy.—The causes of dry pleurisy are pneumonia, tuberculosis, septicæmia, rheumatism, new growths, and extension of disease from adjacent structures, e.g., the lung, the pericardium, the mediastinum, bronchial glands, and from subdiaphragmatic conditions. It often results from injury of the ribs. The pain may be very severe and even excruciating. The patient should go to bed in a well-ventilated room. If fever is present, the nursing should be as for a case of pneumonia. He should lie in the position in which he is most comfortable. Local treatment is usually tried first—various **Hot Applications**, **Iodine**, or various **Liniments**. A useful application is **Menthol**, 1 to 2 drachms dissolved in an ounce of **Chloroform Liniment**. The application of **Leeches** or **Flying Blisters** may give great relief. If strapping is employed, it should be removed in a day or two for examination and to allow the lung to expand. Often these remedies fail, and then in severe cases it is best to give **Morphia**. After the acute pain has lessened **Pyramidon**, **Aspirin**, **Cibalgin**, or other analgesics may be useful. In very severe cases when other measures fail an **Artificial Pneumothorax** can be used.

Pleurisy with Effusion.—All clinical means of investigation should be employed, including examination of the sputum, a blood-count to reveal leucocytosis as an evidence of pus formation, and where possible X-ray examination. Exploratory puncture should be carried out with due antiseptic and analgesic precautions and the fluid examined cytologically and bacteriologically. The majority of cases are due to tuberculosis, and the high lymphocytosis in the fluid and the failure to grow organisms make the diagnosis practically certain. Other cases may be due to the early stages of lobar and lobular pneumonia, infarction of the lung, and malignant growths.

Serous Effusions.—When the serous nature of the fluid is established the patient must be kept at '**Absolute Rest.**' Mild **Saline Aperients** or **Mercurials and Salines**, with **Diuretic and Diaphoretic Mixtures**, may be given. In the acute stage it is better not to remove the fluid unless it increases so rapidly as to cause severe dyspnoea or positive pressure. If signs of collateral hyperæmia of the sound lung or of pulmonary oedema develop, paracentesis should be done at once. In many cases with a small effusion the temperature may quickly subside and complete absorption occur with rapid convalescence. If absorption is slow, paracentesis should be considered, especially if the fever has subsided so as to facilitate absorption and allow re-expansion of the lung, which is liable to be incomplete if the lung is collapsed too long and the visceral pleura becomes greatly thickened. Air or gas replacement is of value and allows all the fluid to be removed and at the same time prevents too rapid expansion of the lung. It is not necessary as a routine procedure.

In carrying out **Paracentesis** careful examination should be made to decide where to aspirate. Common situations are the 6th space in the mid-axillary region or the 7th space near the posterior axillary line or the 8th just below the scapula. The skin is painted with iodine, a bleb made by the intradermic injection of 0.5 per cent novocain or 0.1 per cent percain with or without adrenalin, and then the solution is slowly injected through the bleb, the needle being pushed deeper until the pleura is reached. In about five minutes the aspirating needle can be inserted, the needle being directed over the upper surface of the lower rib. Burrell's siphon apparatus and the three-way Rotunda syringe enable the aspiration to be carried out single-handed. No attempt should be made to withdraw all the fluid, and the tapping should be stopped when cough, distress, or pain supervenes. After the fluid has been absorbed convalescence may be rapid, but the lung may be slow to expand. In every case where tuberculosis is proved or suspected, the patient should be advised to spend at least three months under open-air conditions. When this advice is neglected there is a strong probability of the development of active lung disease within five years. Exercises to promote expansion should be used when the affected side is slow to expand.

Seropurulent and Purulent Effusions.—These are most commonly the result of pneumonia, when they may occur during its course (syn-pneumonic) or as a sequel (meta-pneumonic) or as a result of local or general pyogenic infection, generally streptococcal. They may form in unusual situations. Interlobar empyema is more common than is generally recognized. Mediastinal and apical empyemata occur, but are less common. When in unusual situations the possibility of a malignant growth should be remembered. With empyemata the character of the fluid must be carefully studied. If the fluid is definitely opaque thick pus, and especially if pneumococci are the causal organisms, **Rib Resection** and effective **Drainage** are usually indicated. If the fluid is thin and seropurulent, and especially if streptococci are present, operation should on no account be performed. The fluid should be aspirated,

and this repeated if necessary generally every second or third day until the fluid is definitely opaque pus. Then and not till then should operation be performed.

The operation for empyema requires nice judgement and care in its performance, especially as regards the best site to ensure drainage. Drainage should be carried out by one of the closed or negative pressure methods, a special flanged drainage tube being employed. This is a double tube with a large and a small channel; the latter is used to wash out the cavity with Dakin's or other fluid, and at other times is kept closed. In washing out the pleura fluid must never be allowed to be under pressure in the cavity, consequently the wide tube must never be used to introduce the fluid, but must be left open for drainage of the fluid inserted through the small tube. In the case of double empyemata, aspiration should be carried out alternately on each side until that more affected is ready for operation. The other side is aspirated after the operation until the patient's condition permits of a second operation.

Acute pleurisy is generally regarded as tuberculous unless some other definite cause is found. Particularly is this true of pleurisy with effusion. The literature abounds in reports of patients with pleural effusion who have been followed for years. The percentage of those who develop tuberculosis of the lung varies in different reports according to the treatment during the acute illness, the after-care, the length of time patients are followed up, and the ascertainable cause of death in those who have died. The etiological factor in acute dry pleurisy is less definitely established. M. N. Fulton and R. G. Hahn³ have found very few statistical studies on the subject. F. T. Lord⁴ in 1909 reported 60 cases followed from one to twelve years, 18 of whom developed tuberculosis. H. Allard and H. Koster⁴ in 1911 found that clinical tuberculosis developed in 42 per cent of 57 patients with dry pleurisy. Acute dry pleurisy frequently develops into pleurisy with effusion—a fact which suggests that a dry pleurisy is but a mild or early expression of the pathological process which results in the effusion and so may be taken as just as good evidence of tuberculosis as pleurisy with effusion. Fulton and Hahn review 980 cases of pleurisy seen between 1913 and 1930: 140 were accepted as cases of acute dry pleurisy. Follow-up studies were possible in only 40 of these. Of the 40, 21 were males and 19 females. The average age was 30 with 14 and 54 as extremes. Only 4 of these patients developed pulmonary tuberculosis. The remaining 36 are in good health after periods of from one to sixteen years. Four patients have had one or more recurrences of pleurisy and 2 had lobar pneumonia, a few reported respiratory infections without any sequelæ, one patient at present has chronic bronchitis. Of the 4 patients who developed tuberculosis only 1 had a family history of this disease, whereas 4 of those who have remained well had such a history. In 3 of the 4 tuberculosis developed within one year after the pleurisy. Whilst the numbers are small and have no statistical value, the study suggests that tuberculosis is apt to develop in fewer cases after dry pleurisy than after pleurisy with effusion.

A. B. Taylor,⁵ discussing the treatment of tuberculous empyemata, states that the lines along which effective treatment must proceed must be based upon: (1) The mechanical and toxic effect of the effusion itself; (2) The condition of the underlying lung, usually in some stage of tuberculosis; (3) The general health of the patient—the need and comparative value of radical or palliative treatment. It is useless to risk a patient's life to cure him of suppurative pleurisy when a pulmonary lesion is bilateral and advancing. When the lung trouble is slight or controlled, when a pneumothorax is otherwise

giving good results, or when the patient's condition is good, treatment should be energetic and radical. It should be begun early even if toxic signs are slight, as spontaneous recovery is rare. The immediate necessity is the removal of the fluid; later an attempt must be made to prevent its re-collection. The former is best performed by **Gas Replacement**. This allows one to empty the pleural cavity almost completely, avoids marked changes of intrapleural pressure, prevents sudden mediastinal displacements, allows X-ray control, keeps the pleura dry, and permits a satisfactory adjustment of the intrapleural pressure. Occasionally one or more gas replacements result in healing of the pleura and cure of the condition. More often further treatment is needed. Pleural lavage is often helpful. After gas replacement with two needles still in place antiseptic lotion is run into the pleural cavity, which is then aspirated, the intrapleural pressure being controlled. **Dakin's Solution** and most of the **Aniline Dyes** have been recommended. The first has the advantage of dissolving lymph-clots and tending to soften a thickened and rigid pleura. By continuing pleural lavage combined with gas replacement to keep the cavity dry and empty, the lung may be gradually re-expanded to such an extent that by adhesion of the two pleural layers radical cure is produced. After each operation a negative pressure of from 10 to 20 cm. of water is left, and by maintaining this for several weeks the lung is drawn out. When the lung is brought constantly into contact with the parietal pleura adhesion will occur and further effusion be prevented. Certain conditions must be present before this successful result can be achieved. It is useless to re-expand a lung containing active tuberculosis or where reactivation of old disease is likely to occur. After artificial pneumothorax has been maintained for over two years for a lesion originally slight it is fairly safe to expect the lung to be healed. Or with a purely pleural lesion and the knowledge of a more or less normal lung beneath its re-expansion is not contra-indicated.

Another useful method is that of **Pleurotomy with Constant Drainage**. When secondary infection has occurred and pleural lavage does not control the effusion and toxæmia, or when re-collection of the effusion is so rapid that reasonably spaced gas replacements are insufficient, or when a pleuro-pulmonary fistula is present, some form of constant drainage is required. A de Pezzer catheter placed intercostally is often sufficient, and by drainage under water at a low level a steady negative pressure is developed which gently pulls on the lung and keeps the effusion drained and away from any fistula, which is thus given a chance to heal. Rarely does this procedure produce permanent cure. A sinus persists, the chest wall may become infected, and the effusion may be secondarily infected. The method is useful as a temporary measure or when the patient is too ill for radical treatment. **Oleoathorax** is mainly indicated in recurring purulent effusions when it is desired to maintain collapse of the lung, in cases in which the toxæmia is severe, in cases secondarily infected before surgical treatment is begun, or in the presence of pleuro-pulmonary perforations which may be healed by the oil. Experience in this country has not been very satisfactory. Finally, the use of **Thoracoplasty** has provided one of the most valuable methods and is making the outlook in individual cases much more favourable. When there is active disease on the affected side only, or when the disease has been locked up by fibrosis and scarring and re-expansion would be dangerous, thoracoplasty is the operation of choice. Phrenic avulsion is preferably performed first; it reduces the size of the cavity, it tests the other lung under conditions of increased mobility, and it puts at rest the actively diseased lung and pleura. Subsequently a paravertebral thoracoplasty is performed, usually in two stages. The pleural cavity may need frequent emptying as the collapse takes place, aided by a

special belt and the use of heavy weights on the chest wall. The results of treatment in any series of cases is never encouraging, as so many of the patients are in late stages of advanced disease, and in others, though the empyema is cured, the pulmonary lesion may progress. Of the 79 cases occurring at the Brompton Hospital between 1915 and 1930, 25 (31.6 per cent) were alive in 1931 and 8 were not traced. Pleural washouts alone were used in 18, with a mortality of 50 per cent, and in addition to gas replacements in 57 cases, with a mortality of 52.6 per cent. Eleven cases were treated by drainage alone, with a mortality of 63.6 per cent, but these were mainly the severe and advanced cases. Thoracoplasty was employed in 13, with a mortality of 30.8 per cent.

REFERENCES.—¹*Practitioner*, 1932, July, 33; ²*Jour. Amer. Med. Assoc.* 1931, Dec. 26, 1959; ³*Boston Med. and Surg. Jour.* 1909, April 15, 469; ⁴*Hygiea*, 1911, Oct. 10, 1105; ⁵*Proc. Roy. Soc. Med.* 1932, April 26, 1615.

PNEUMOCOCCAL PHARYNGITIS. (See PHARYNGITIS.)

PNEUMONIA.

W. H. Wynn, M.D., F.R.C.P.

Y. Henderson¹ advocates the use of **Carbon Dioxide with Oxygen** in the treatment of pneumonia. He uses a mixture of 5 per cent carbon dioxide and 95 per cent oxygen which he terms 5 per cent 'carbogen'.



Fig. 60.—Showing carbogen tent and cylinder with reducing valve and pressure gauges, from which the gas passes through a small tube at the top of the figure and is injected into the large tube above the tent. A circulation is thus induced through the cooler filled with ice from which the air, cooled, dried, and enriched with oxygen and carbon dioxide, passes into the tent again through a large tube at the back of the patient's pillow. The nurse is shown taking a sample of the atmosphere of the tent for analysis with the syringe analyser recently described by L. A. Greenberg and Y. Henderson. (By kind permission of *The New England Journal of Medicine*.)

The advantages claimed are: (1) Deeper breathing, which prevents the development of occlusion and tends to open parts already occluded. (2) Under inhalation of carbon dioxide, morphine or other narcotic drugs may be used freely to counteract excitement and restlessness. The stimulus to respiration tends to counteract the depression of breathing caused by such drugs. (3) Carbon dioxide in solution becomes carbonic acid and tends to exert a bactericidal effect upon the pneumococcus and a resolving action upon the pneumonic exudate. These effects are best obtained when inhalation of carbon dioxide is combined with administration of morphine. While carbon dioxide tends to lower the pH of the blood and of the pneumonic exudate, it does not decrease the blood alkali or tend to produce an acidosis, but rather the contrary. The author describes a tent suitable for the administration of oxygen

alone or of carbogen. Air is drawn out of the top of the tent and returned to it back of the pillow by means of a thermo-syphon and simple injector (Fig. 60). With a flow of 7 litres per minute a circulation is induced sufficient to pass the entire atmosphere through the cooler (containing broken ice or carbon-dioxide snow) in two minutes. The concentration of oxygen in the tent is usually about 50 per cent. When oxygen alone is used the concentration of carbon dioxide in the atmosphere is 1.6 to 2 per cent. When 7 per cent carbogen is used the concentration is from 4.5 to 5 per cent. The temperature under the tent is 3° to 7° lower than in the surrounding room. (See also PHARMACOLOGY—OXYGEN AND CARBON-DIOXIDE THERAPY.)

B. Taylor² describes the use of **Artificial Pneumothorax** in the treatment of pleurisy and pneumonia as first employed by Wynn. A small quantity of oxygen is introduced into the pleural cavity sufficient only to separate the layers without appreciably collapsing the lung. The method used is the same as for any other artificial pneumothorax except that the needle is inserted where the pleurisy is most marked as evidenced by the loudest friction sounds and greatest pain. The use of a local anæsthetic, such as 2 per cent novocain, is always necessary as the pleura is more sensitive than usual: 400 to 500 c.c. of oxygen are inserted. The pain is typically relieved almost completely, the relief appearing as the end of induction is reached. Generally complete relief is obtained some minutes later and it is then noticed that the respirations are slower and more regular and the patient rapidly falls to sleep. The pulse-rate usually slows by twenty or more beats per minute and a corresponding improvement in the general condition is evident. The pneumothorax will last in most cases three or four days, maintaining its effect. After a few days friction sounds often return, but as a rule are not accompanied by pain. The best results have been with pleurisy in the lower axillary region where the ribs are well apart and the respiratory movement is greatest. In diaphragmatic pleurisy it is an advantage to raise the foot of the bed to allow the oxygen to run up to the base.

J. J. Coghlan³ describes 6 cases of pneumonia treated by artificial pneumothorax. He claims that it: (1) Separates the inflamed pleural surfaces, relieves pain, and allows of easy respiration; (2) Puts the inflamed lung at rest; and (3) Limits the flow of blood through the pneumonic lung, thereby diminishing anoxæmia and interfering with the passage of toxins into the circulation. From the experience gained he concludes that artificial pneumothorax initiates a series of events almost indistinguishable from a natural crisis and that the control of the pneumonic process is at first only temporary, persisting merely as long as air remains in the pleural cavity. A striking feature was the rapidity of the onset of the natural crisis; profuse perspiration set in almost as soon as the needle was withdrawn and cyanosis and dyspnœa were relieved in about fifteen to thirty minutes. He considers that the absorptive capacity of the pleura in pneumonia is abnormally high and that the time taken to absorb the air was only a matter of hours, after which time the pneumonic process becomes re-established so that repeated refills may be necessary. (Taylor in one of his cases found that the pneumothorax was distinctly visible on radiograms taken four days after the induction but was not recognizable after ten days. This case had 500 c.c. of oxygen only.)

E. E. Cornwall⁴ opposes the old therapeutic tradition that the treatment of disease should be commenced with a clearing out of the bowels. He advocates the **Conservative Management of the Bowels**, by which is meant that evacuations are not artificially produced during the active period of pneumonia in routine fashion, but only for special reasons—that is, for other

reasons than failure of daily actions. Artificially produced actions disturb the patient more than natural ones. They favour fluidity and increased bacterial growth and excite nervous reflexes which affect unfavourably the cardiovascular system. They may endanger the patient's life from the physical exertion required, and they encourage gaseous distension. When the patient is first seen in an early stage of the disease and has not had an evacuation for twenty-four hours, an enema may be given, but not if the patient is in a late stage or in poor condition when first seen. Thereafter no enemas are given during the active period except for special conditions such as tympanites which is not controlled by diet, or a feeling of fullness of the rectum. An enema is given on the second day after convalescence. Cathartics by mouth are never given.

H. E. Stewart⁵ has used **Diathermy** in pneumonia for ten years. Electrodes are selected of a size to more than cover the involved area. They are covered with thick shaving-soap lather and carefully moulded to the chest wall antero-posteriorly. The current is slowly increased to a maximum of 1800 to 2500 ma. and maintained for from twenty to sixty minutes as the case requires, after which it is slowly reduced. He claims a mortality of only 11·9 per cent in nearly 700 cases.

W. Doolin⁶ has used **Collosol Iodine** in a series of 30 cases with 3 deaths: 2 of the deaths occurred in patients over 80, and 1 in a man of 56 with advanced myocardial degeneration. At first 10 c.c. of a 0·2 per cent solution was used, but later 10 c.c. of a 0·4 per cent solution or 5 c.c. of a 0·8 per cent. Of the cases typed all were Group IV, and the case reports do not suggest that many cases were of a severe type.

R. R. Armstrong⁷ describes a method by which the type of pneumococcus can be determined by direct test on the patient's sputum without recourse to mouse inoculation. A suitable fleck of sputum is selected. Three small samples are placed equidistant on a microscope slide and numbered 1, 2, and 3. Each sample is emulsified with four times its volume of the corresponding diagnostic serum, the addition of serum and emulsification being conveniently performed with a platinum loop. Cover glasses are applied and the slide is set aside for a few minutes whilst a further sample from the selected fleck of sputum is stained on another slide by Gram's method. The first slide is now examined with a 1/6 objective, 4 ocular, and plane mirror. Whereas the unstained pneumococci when present in small numbers are but just visible in the case of a negative test, the result with a positive reaction is a conspicuous increase in the size of the individual pneumococcus. The enlarged cocci have a ground-glass appearance with a highly refractive peripheral zone. A positive reaction is at times appreciable with the naked eye on holding the preparation to the light. The positive is seen to be opalescent when compared with the controls. The results of the direct test have been confirmed by mouse inoculation and other methods and have proved trustworthy.

F. T. Lord⁸ states that the spontaneous appearance of mouse protective substances in patients with lobar pneumonia usually coincides sharply with the crisis. Protection tests were done on 63 patients. Of 8 tested during the first two days of the illness, none showed protection. The earliest appearance was on the third day in 3 of 11 cases. It was demonstrated on the fourth day in 5 of 14 cases. Crisis and recovery may not occur at once after the spontaneous appearance of protection. Antibody may appear as early as the third or fourth day and recovery be delayed until the sixth to tenth day. Protective substances have an important bearing on the outcome. With them a large proportion recovers and without them a large proportion dies. The amount of demonstrable antibody at the time of the crisis in untreated

cases was small and did not exceed 0.05 Felton's units per cubic centimetre. Recovery without demonstrable antibody during the illness and its appearance later occurred in several cases. This suggests that other factors are concerned. Lord's experience with the **Serum** treatment of Type I pneumonia embraces 99 cases with 20 deaths, a mortality of 20.2 per cent: 93 contemporaneous untreated controls gave a mortality of 24.7 per cent. The rather more favourable showing of the treated cases was due to the low mortality when treatment was begun within the first three days—32 cases with 3 deaths, 9.3 per cent. Treatment on the fourth day failed to lower the mortality—32 cases with 25 per cent.

R. L. Cecil and N. Plummer⁹ have studied 1000 cases of Type II pneumonia considered from the standpoint of a specific disease entity. Like Type I pneumonia it runs a characteristic febrile course usually terminated in crisis: 28 per cent of 4310 cases of lobar pneumonia in adults were Type II infections. Only 9 out of 329 cases of pneumonia in children were Type II. Curves of the age distribution show a higher incidence of Type I up to the age of 30 and a slightly higher incidence of Type II beyond that age. Curves of the seasonal incidence are almost identical. The incidence of complications varies but slightly in the two types except as regards empyema, which occurs only about half as frequently in Type II as in Type I. Endocarditis as shown post mortem was twice as common in Type II as in Type I. In 202 Type II cases in which no serum was given 46.4 per cent showed Type II pneumococci in the blood. This is considerably higher than the figure obtained for Type I (29.7 per cent) and explains why Type II infection is so much more serious. Type II pneumonia has a mortality rate of 48.8 per cent—almost twice as high as that of Type I. The death-rate in septic cases was 87.5 per cent. The immune serum contains antibodies against the Type II organism and regularly protects mice from Type II infection.

Felton's Concentrated Serum is shown to be from six to twenty times as high as unrefined serum in its content of antibodies and protective substances. A definite clinical effect following the early administration of concentrated Type II serum is often demonstrable. The course of the disease is usually milder and the blood more frequently remains sterile. In a series of 252 cases of Type II pneumonia treated with Felton's serum the mortality rate was 40.5 per cent as compared with a rate of 45.8 per cent in 253 alternate controls. During the last year of investigation only early cases were included and 21 had the benefit of intensive serotherapy, with a death-rate of only 14.3 per cent. The authors conclude that Type II concentrated serum has definite though not striking clinical value.

D. C. Sutton, A. L. Kendall, and A. Rosenblum,¹⁰ after obtaining encouraging results with **Commercial Vaccines**, studied various methods of preparing **Bacterial Antigens**. They insist upon the importance of using only the bacterial cell washed free of its medium and excreta. They use 'resting bacteria', a term introduced by Quastel, and quote Kendall, who states, "Bacteria in the 'resting state' are harvested at the height of their growth and activity from suitable culture media, washed free from all traces of culture medium by repeated suspension in physiological salt solution and centrifugation, and finally vigorously aerated to eliminate auto-oxydizable substances." With commercial vaccine 483 patients treated had a mortality of 26.3 per cent as compared with 625 controls with a mortality of 41.7 per cent. With the natural bacterial antigen 129 cases gave mortality of 22.5 per cent as compared with 389 controls having a mortality of 42.1 per cent. The authors believe that the results offer strong evidence that bacterial antigens are of value in the treatment of all types of pneumonia, and that the variable

results from different antigens depend largely upon the method of preparation. They consider that the results compare favourably with those obtained with serum.

REFERENCES.—¹*New Eng. Jour. Med.* 1932, Jan. 28, 151; ²*Practitioner*, 1931, Sept., 389; ³*Lancet*, 1932, i, 13; ⁴*Med. Jour. and Record*, 1931, July 15, 54; ⁵*Ibid.* Dec. 16, 581; ⁶*Irish Jour. Med. Sci.* 1931, July, 289; ⁷*Brit. Med. Jour.* 1932, i, 187; ⁸*New Eng. Jour. Med.* 1931, Nov. 29, 854; ⁹*Jour. Amer. Med. Assoc.* 1932, March 5, 779; ¹⁰*Amer. Jour. Med. Sci.* 1931, Oct., 454.

POISONING. (See SKIN, FUNGUS AFFECTIONS OF; THALLIUM POISONING; TOXICOLOGY.)

POLIOMYELITIS, ACUTE ANTERIOR.

Macdonald Critchley, M.D., F.R.C.P.

The autumn of 1932 saw a re-opening of the old problem as to the correct procedure when poliomyelitis breaks out in a boarding-school. Briefly, the question narrows itself down to whether or not the pupils should be disbanded. In the absence of certain knowledge as to the mode of invasion and spread, dogmatic utterances are out of place. On the one hand, by closing the school and sending the pupils to their homes, there is a risk that every one of the contacts may disseminate the malady among the general population. Particularly is this the case when the pupil returns to a household containing other children, or when the parents are temporarily out of the country and the pupil is of necessity sent to a hotel or pension. On the other hand, by keeping the pupils together at the school there is a risk of perpetuating the circumstances under which the disease has arisen, and on theoretical grounds there is greater danger of spread owing to the closeness of contact. Thus the risks to the community are pitted against the risks to the few. The Ministry of Health favours the policy of keeping a school open; however, in a disorder of low infectivity such as poliomyelitis it is arguable that the correct policy would be to disband the school, at the same time ensuring that each pupil goes to a home where partial isolation can be carried out for fourteen days under the direction of the practitioner and the local Medical Officer of Health. During that period the boy should be watched for intercurrent malaise and fever, and, if necessary, lumbar puncture should be performed.

Antiserum Treatment.—Impressed with the growing severity of outbreaks of poliomyelitis in the United States, S. Flexner in 1928 suggested to the Public Health Relations Committee, via the New York Academy of Medicine, that arrangements should be made for the collection, storage, and distribution of convalescents' serum against future epidemics.¹ Accordingly a sub-committee was appointed with the following terms of reference: (1) To consider the value of convalescents' serum and its method of administration; (2) Collection of the serum; (3) Preparation of the serum; (4) Administration of the serum and compilation of the records; and (5) Announcements to the medical profession. Considerable amounts of blood were collected from volunteers among convalescent patients attending the various orthopaedic and other hospitals in New York; from time to time, advertisements were inserted in the paper asking for patients to appear at the special clinic. No definite rate of payment was determined, but in most cases the donors were given \$5 to \$10 in addition to their taxi-fare; some of the well-to-do offered their blood gratuitously. Blood was taken to the Laboratory of the City Department of Health where the serum was prepared and distributed. Special physicians were appointed and paid at the rate of \$15 per patient. Their duties included examination and note-taking; performance of lumbar puncture with the immediate carrying out of a cell-count; intraspinal and intravenous

(or intramuscular) administration of the serum on two consecutive days; and follow-up visits. This work was carried out in conjunction with the family physician. It was agreed that the family should be asked to pay \$25, but that no money was to be demanded of families who could not afford to pay. Articles on the early diagnosis of poliomyelitis were circulated among the medical practitioners. Full instructions were drawn up for the guidance of the physicians administering the serum. Either 20 c.c. intraspinally plus 50 c.c. intravenously or intramuscularly were to be given, or 70 c.c. intravenously and/or intramuscularly. Approximately twenty-four hours later, a second dose of 20 c.c. should be given intraspinally, if the first dose was given by that route; otherwise, 20 c.c. were ordered intravenously or intramuscularly. Serum should not be given if paralysis had existed for more than twelve hours. The cost of obtaining serum alone was computed at \$40 a head.

A careful statistical study was made of the cases of poliomyelitis occurring in the City of New York during the years 1928, 1929, 1930, and 1931. Details were made as to the mortality, extent of paralysis, etc., in treated and untreated cases, note being made as to the exact stage of the disease when the serum was given, and also as to the clinical severity of the case. Unfortunately in view of the varying nature and severity of this disease, special difficulties arise in the attempt to assess the value of any therapeutic measure applied during the pre-paralytic stage. Allowance must be made for mistaken diagnoses; mild cases which would have recovered without sequelæ independently of treatment; cases where serum has been given too late; malignant, progressive and bulbar types of the disease. It is not surprising, therefore, that the findings of the New York study should have proved inconclusive. The participants feel that more accurate and more intensive work along these same lines is required.

Other disappointing or inconclusive results from the serum treatment of poliomyelitis have been obtained by S. D. Kramer and W. L. Aycock² from a series of 82 cases about half of which received serum. Of the cases so treated, the percentage which became paralysed was 12.1, and of the untreated cases, 5.0. [It is noteworthy that among the treated cases were 5 severely paralysed patients.] The authors conclude that they failed to obtain statistical evidence that serum is effective, but at the same time they were unable to conclude that serum is of no value. W. H. Park³ points out that we know of no other virus disease which can be benefited by an immune serum after the development of symptoms. There may still, of course, be a prophylactic action and indication for serum.

Obviously the present position is highly unsatisfactory, and there is a difficulty in obtaining unequivocal evidence for or against the use of serum in the treatment of poliomyelitis. To-day the common-sense counsel would be to employ serum if available, within the first thirty-six hours of the disease. It appears to offer a rational remedy for the malady. The disadvantages attendant upon its use are greatly outweighed by the possible advantages and the moral satisfaction of not having deliberately refused a measure which might have averted permanent disablement. No ill-effects are to be anticipated from intravenous or intramuscular administration. It is doubtful whether anything is gained by the intraspinal route, and, indeed, the introduction of foreign protein into the spinal theca, and the necessary withdrawal of large amounts of cerebrospinal fluid, are both liable to be followed by serious untoward results in this disease.

REFERENCES.—¹*Bull. N.Y. Acad. Med.* 1932, viii, 613; ²*New Eng. Jour. Med.* 1932, cccvi, 432; ³*Jour. Amer. Med. Assoc.* 1932, Sept. 24, 1060.

POLIOMYELITIS, ACUTE ANTERIOR, SURGERY OF: (See also JOINTS, SURGERY OF—KNEE-JOINT.) *John Fraser, Ch.M., F.R.C.S.Ed.*

A helpful summary of the operative and post-operative treatment of infantile paralysis is given by F. R. Ober.¹ The merit of the contribution is in relation to the various operations which the author has found of value as the result of a long and varied experience in cases of this type. It is impossible to give any detailed summary of the paper, but certain of the more important recommendations may be referred to.

1. When any tendon transplantation is done on the foot a Hoke stabilization should be accomplished at the same time, for the reasons that it maintains the lateral stability of the foot, while it enables the transplanted tendon to assume its new function more readily. An exception to this rule arises when the extensor longus hallucis is transplanted to reinforce a weakened tibialis anterior.

2. In transplantations at the knee to reinforce an extensor paralysis it is recommended that the sartorius and the tensor fasciæ latæ be transplanted into the knee-cap and the suprapatellar tendon.

3. In paralysis of the gluteus maximus (one of the most common types of hip region paralysis) the iliotibial band is detached from the head of the fibula up to the level of the muscle body, the long tendinous flap is thereafter passed over the gluteal muscle and sutured to the erector spinæ muscle. The transplant acts as a stabilizer of the hip, and improves the patient's gait and ability to get in and out of chairs and to go up and downstairs.

4. In cases of deltoid paralysis an arthrodesis of the shoulder-joint is done, the arm being maintained at 70° of abduction and the elbow slightly anterior to the coronal plane.

5. Of the various paralytic disabilities of the hand affection of the opponens pollicis is the most serious, and in cases of this kind Ober practises an operation which is a combination of those described by Nye and by Bonnell. The tendon of the extensor brevis pollicis is divided above the wrist, the distal end is thereafter passed over the thumb base beneath the short muscles of the thumb and through the carpal arch, where it is sutured to the central end of the tendon of the flexor sublimis digitorum of the ring finger.

REFERENCE.—¹*New Eng. Jour. Med.* 1931, Aug. 6, 300.

POTT'S DISEASE. (See SPINAL DISEASE AND DEFORMITY.)

PREGNANCY AND ITS COMPLICATIONS. (See also DIABETES—COMPLICATIONS—PREGNANCY; NEURITIS, PERIPHERAL—TOXIC NEURONITIS OF PREGNANCY; OBSTETRICS AND RADIOLOGY.)

Beckwith Whitehouse, M.S., F.C.O.G.

Pregnancy Diagnosis Tests.—The application of the hypophyseal hormone reaction, commonly known as the *Zondek-Aschheim test*, to the clinical diagnosis of early pregnancy continues to receive much attention at the hands of clinicians. A large amount of literature on this subject has appeared during the last year both in European and American journals, and all writers confirm the reliability of the reaction as a diagnostic measure.

Karl Ehrhardt,¹ working in Professor L. Seitz's Clinic at Frankfurt-a-Main, has made more than 2000 controlled tests, and without any knowledge of the clinical picture secured a correct diagnosis in 98 to 99 per cent. This writer expresses the view that many so-called inaccuracies are due not to the reaction itself but to the individual investigator.

S. Aschheim and B. Zondek² have grouped the actions of the anterior-lobe hormone into three phases, called respectively Reactions I, II, and III. Reaction I, constituted by enlargement of the uterus, production of follicles, and œstrus,

is not significant in the diagnosis of pregnancy. It occurs in the presence of various uterine and ovarian neoplasms, e.g., fibromyoma, carcinoma, at the commencement of the menopause, and in some cases of functional amenorrhœa unrelated to pregnancy. Reaction II, characterized by the appearance of *hæmorrhagic* follicles, and Reaction III, the formation of corpora lutea, definitely indicate pregnancy. Ehrhardt¹ notes that it is fairly easy to make mistakes in identifying Reaction I and differentiating it from Reactions II and III. The value of a report upon the Aschheim-Zondek reaction depends largely, therefore, upon the ability of the investigator who makes the test and upon his knowledge of the morphology and biology of infantile rodent ovaries. For details of the test the reader is referred to previous editions of the MEDICAL ANNUAL (1931, p. 371, 1932, p. 391).

The Friedman³-modification of the original test, in which an unmated mature female rabbit is used instead of five immature white mice, has received further investigation at the hands of Max Davis and E. W. Walker⁴ and G. Dodds.⁵ Davis and Walker inject 10 c.c. of the first-voided morning urine into the marginal ear vein of the animal selected. The technique is much more simple than the original Aschheim-Zondek method, and a further advantage is that the result can be obtained at the end of twenty-four to thirty-six hours instead of at the end of one hundred hours. A perusal of the published results proves that the modification has certain undoubted advantages in so far as ease of technique and laboratory facilities are concerned. [We are not convinced, however, that its reliability is as yet entirely proved, and from the data published are certainly not prepared to go so far as G. Dodds in her statement that the modified technique is "as reliable as the Zondek-Aschheim test".—B. W.]

Pregnancy and Heart Disease.—In a discussion at the Royal Society of Medicine on medical indications for the premature termination of pregnancy, the relation of pregnancy to heart disease was considered by Thomas F. Cotton.⁶ Although infections may contribute to a cardiac breakdown, it is important to remember that the essential causative factor of heart failure in pregnant women is purely mechanical. Increased body weight, and blood-volume, upward displacement of the diaphragm, and a raised metabolic rate combine to produce a mechanical load which a damaged heart may be unable to carry. Mechanical injury, however, may be prevented more easily and more effectively than an inflammatory process. Individual prognosis is therefore a matter of no little importance, and this must be based upon the careful application of reliable symptoms and signs. If the heart is enlarged and the auricles are fibrillating, congestive failure is likely to develop. When these signs are present *during the early months of pregnancy*, the gestation should be terminated. On the other hand, when there are signs of congestive failure *in the later months of pregnancy*, the risk to life is greater by terminating the pregnancy than by allowing the patient to go to term.

In the case of pregnant women with chronic valvular lesions who are actively infected with rheumatism, the author is of opinion that therapeutic abortion before the end of the third month is indicated. Women with active rheumatism complicating cardiac lesions are made worse by pregnancy, just as in the case of women with active pulmonary tuberculosis. Patients with chronic valvular disease who are not actively infected with rheumatism may, on the other hand, be allowed to go to term with safety.

Cotton observes that one or two pregnancies in women of this class do not appear to alter the natural course of the disease. It must be recognized, however, that *repeated pregnancy*, especially in the working woman, will shorten her life. There is therefore in the hospital class a clear indication

for terminating pregnancy in a multipara during the early months of gestation. Dyspnoea of cardiac origin, mitral stenosis with a history of hæmoptysis, or pulmonary œdema before pregnancy are of course indications for therapeutic abortion should pregnancy occur in a patient of this type.

The author is of opinion that the tendency in recent years to allow a larger number of women with heart disease to go to term than was the practice in the past is justified. That the immediate results are satisfactory is proved by series of cases recorded by Louise McIlroy and Crighton Bramwell.⁶ The final decision, however, must rest upon a careful study of the after-histories of these same patients. As Cotton rightly observes, we must be none the less vigilant in recognizing the woman whose life will be shortened by an aggravation of her heart affection if the pregnancy is not terminated before irreparable damage has been done.

Crighton Bramwell in the same discussion stressed the importance of first treating heart failure as such and restoring the circulatory balance as far as possible before a pregnancy is terminated. Evacuation of the uterine contents must never be the first item in the programme.

(See also HEART IN PREGNANCY.)

Pregnancy and Influenza.—In a series of 61 cases of pregnancy associated with influenza investigated by M. I. Litwak⁷ in Leningrad during the epidemic of 1927 and 1928 the fetal mortality was 20 per cent. Induction of pre-mature labour, and in fact any obstetric operation with the exception perhaps of low forceps application, is contra-indicated owing to the increased risk of autogenous puerperal infection which association with influenza entails. Litwak found respiratory complications very common in patients infected shortly before labour. Maternal mortality is also much less in women infected during the puerperium as contrasted with those who develop the disease immediately before labour.

(See also INFLUENZA.)

The Sequelæ of Eclampsia.—The after-results of late toxæmias of pregnancy accompanied by convulsions have been studied by M. P. Rucker⁸ in 103 private and hospital patients including both white and coloured races. Recurring eclampsia was found in 7.5 per cent of the 'follow-up' cases, a figure which compares favourably with R. Bund's⁹ estimate of 28 per cent recurrences in women attending the Marburg Clinic. Evidence of toxæmia without convulsions was found, however, in 16 to 27 per cent of post-eclamptic pregnancies and the yield of live births per pregnancy is somewhat less after eclampsia. This can probably be accounted for by the raised incidence of toxic pregnancies. Upwards of 13 per cent of the private patients in the author's series subsequently were found to have hypertension, and 3 deaths from 'cardio-renal' lesions occurred in 86 patients who were traced for three years or longer. Another interesting observation made by Rucker is that tuberculosis had a higher incidence in post-eclamptic patients than one would naturally expect.

Hydatidiform Mole.—In the course of the last year a noteworthy addition has been made to our knowledge of the symptomatology of hydatidiform or vesicular mole—namely, the *abnormally high concentration of the anterior pituitary hormone in the blood and urine*. Karl Ehrhardt¹⁰ has recently drawn attention to this observation based on investigations of Aschheim, Zondek, Robert Meyer, Roessler, and himself, and emphasizes the important clinical bearing that it has upon the diagnosis of this disease. By a quantitative urine analysis and the application of the Zondek-Aschheim reaction it is possible to establish a definite diagnosis. Ehrhardt cites two cases where a *quantitative test* established a definite diagnosis, which otherwise must have remained doubtful. In

one patient the reaction was positive with $\frac{1}{520}$ c.c. of urine and in the second with $\frac{1}{480}$ c.c. In a third case the liquor amnii also gave a positive test. Establishment of the fact that such minute quantities of urine are capable in this disease of effecting a positive reaction is an interesting advance in the practical application of biochemical methods to clinical medicine. The author emphasizes the importance of following up and treating all patients with hydatidiform mole until the hypophysial normal reaction becomes negative.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1931, Oct., 486; ²*Die Schwangerschaftsdiagnose aus dem Harn*, 1930, Berlin, S. Karger; ³*Amer. Jour. Obst. and Gynecol.* 1931, March, 21, 405; ⁴*New Eng. Jour. of Med.* 1931, Sept. 17, 566; ⁵*Brit. Med. Jour.* 1931, ii, 700; ⁶*Proc. Roy. Soc. Med.* 1931, Dec., 247; ⁷*Arch. f. Gynäkol.* cxlviii, Pt. 8; ⁸*Amer. Jour. Obst. and Gynecol.* 1932, Feb., xxiii, No. 2; ⁹*Zentralb. f. Gynäkol.* 1925, xlix, 2884; ¹⁰*Surg. Gynecol. and Obst.* 1931, Oct., 486.

PRIAPISM. (See PENIS, SURGERY OF.)

PROSTATE, SURGERY OF. (See also MYOCARDIUM, DISEASE OF.)

Hamilton Bailey, F.R.C.S.

Etiology of Prostatic Hypertrophy.—Prostatic enlargement occurs chiefly in white races; the condition is almost unknown in Africans and Asiatics, whose sexual life is rather unrestricted. Obviously, therefore, it is not due to sexual excess, nor is there the slightest foundation for the theory that it is due to previous venereal infection. Prostatic enlargement is also very rare amongst celibate priests. Married men are the chief victims. E. W. Hirsch¹ attributes the condition to distension and congestion of the gland by retained products in those who, after leading a normal sexual existence, begin to practise abstinence when they reach middle life. R. E. Davison² states that 34 per cent of men over 60 have an enlarged prostate, and about half of these have symptoms.

Transurethral Partial Prostatectomy.—This is undoubtedly the item of greatest interest and importance in the surgery of the prostate gland this



Fig. 61.—McCarthy's visual prostatic electrotome.

year. J. F. McCarthy,³ of New York, working with Wappler, has perfected a posterior urethroscope fitted with a cutting loop electrode (Fig. 61). With this instrument, strips of the prostate can be cut away under vision, leaving a prostatic urethra of adequate calibre and thereby rendering the patient symptom-free. To an experienced cysto-urethroscopist, armed with this instrument, which, by the way, costs from £50 to £100, the manoeuvre presents no overwhelming difficulty, but special training and experience are necessary. For an elderly patient transurethral prostatectomy is a considerably less formidable procedure than the suprapubic or perineal operation, and the convalescence is much shorter—days instead of weeks. The same careful pre-operative preparation and tests for renal efficiency as in other forms of prostatectomy are necessary, and a number of observers advocate vasoligature in addition (see TESTIS, ETC., SURGERY OF—PREVENTION OF POST-OPERATIVE EPIDIDYMO-ORCHITIS).

Transurethral partial prostatectomy is not new. With various apparatuses for many years the punch operation of Young and tunnelization by diathermy have been practised. Such operations have been for the most part confined to certain cases—namely, median bar obstructions, small fibrous prostates, and cases of irremovable malignant disease.* The principal dangers of the transurethral operation were hæmorrhage, and, above all, sepsis occurring in the eschar after diathermy. It was these two complications, combined with belief that it is usually unsatisfactory to remove a *portion only* of neoplasm, that deterred widespread adoption of transurethral prostatectomy for prostatic enlargement. With McCarthy's apparatus hæmorrhage can be controlled by changing the cutting loop for a button electrode, which can be applied to the bleeding point. Canny Ryall⁴ reports that in over 80 consecutive cases of endoscopic prostatic resection with his own pattern of the instrument, he has had no case where hæmorrhage caused concern. Sepsis has been considerably minimized by the perfect electric cutting apparatus, which operates so quickly that a mass of dead and dying tissue is not left behind as heretofore.

What part transurethral resection of the prostate will play in the future surgery of this organ is difficult to estimate. There are those who at the present time exhibit an unbridled enthusiasm for the method and forecast that suprapubic prostatectomy will be obsolete in a few years' time. There are others who take a much more moderate view. Hugh Cabot,⁵ in an address at St. Bartholomew's Hospital, said: "The operation is most obviously suited to patients with *small* glandular hypertrophies, and in general to the smaller types of obstruction. At the present time at the Mayo Clinic something like half the cases of prostatic obstruction appear to us to be wholly suited to this method." H. W. Martin,⁶ of Los Angeles, predicts that 25 to 30 per cent of prostatic hypertrophies will be suitable for the method. Clyde Collins,⁷ who has been working at transurethral prostatectomy for many years, reserves the operation for selected cases only.

McCarthy himself believes that men who have reached the prostatic age who are troubled with frequency should have a transurethral resection even though there is no residual urine present. This method of removing prostatic obstruction will undoubtedly encourage many patients to seek earlier relief, before damage has been done to other organs. The fear of having a prostatectomy, which has hindered many, can now be overcome. If this hope is realized, in future, suprapubic prostatectomy will be limited to a small percentage of cases, and perineal prostatectomy is likely to be superseded altogether. According to McCarthy the prostate 'is at the cross roads'—a fact which must be admitted.

Technique.—The patient is given spinal, sacral, or caudal anæsthesia, and placed in the usual cystoscopy position. The bakelite sheath of the McCarthy cysto-urethroscope is introduced carefully so as to avoid causing hæmorrhage. The cautery loop which is fitted to the optical part of the instrument is then introduced. The verumontanum is located, and this is the anterior guide, as it is always at the apex of the gland. The loop is then made to encircle the portion to be removed, the current is switched on, and strips of prostatic tissue are removed by the cautery cutting loop rather rapidly under perfect vision. To begin with, McCarthy advises the operator, even if he be an experienced urologist, to confine his attention to the floor of the urethra. Bleeding points can be controlled by touching them with the button electrode. At the end of the procedure the bladder is irrigated until the returned fluid is quite clear. A large rubber catheter is then passed through the meatus into the bladder and retained.

Post-operative Care.—The bladder is frequently irrigated through the catheter with normal saline. After the drainage has been consistently clear for two days, which is generally about the fourth or fifth day, the patient can get up and if necessary be discharged, but it is advisable to keep him under strict observation for two or three weeks.

Difficulties and Dangers.—There are cases in which, owing to the narrowness of the urethra, it is impossible to pass an instrument of this calibre. R. V. Day⁸ reports that he has had confidential communications from two noted urologists who have been in the forefront of transurethral resection procedures. Each of them states that in his first hundred cases he had plenty of grief, with a mortality equal to that of suprapubic prostatectomy, or even greater. If the resection is done in the presence of infected urine, and, above all, if post-operative drainage is not adequate, pyelonephritis is particularly liable to supervene.^{9,10}

What will eventually evolve from the prostatic tissue left behind is a question which will probably be answered in less than a decade. Some consider that the incidence of prostatic carcinoma will rise.

Suprapubic Prostatectomy.—Swift Joly¹¹ stresses that it is better to operate early if the prostate is causing slowly progressing obstruction. He advises operation in a man of 60 who has more than 2 oz. of residual urine or in a man of 70 with more than 6 oz. If the man is over 75, he does not suggest operating for anything less than 10 oz.

In the discussion on prostatectomy at the B.M.A. Centenary Meeting, Kenneth Walker¹² concentrated on those sequelæ that bother the surgeon in the latter stages of a prostatic's convalescence. Foremost of these is the non-closure of the bladder wound, which is due to (1) persistent sepsis, (2) the presence of a post-prostatic stricture, and (3) adherence of the vesical wall to the abdominal wound. One of these factors alone is sufficient to prevent closure of a suprapubic sinus, but commonly two of them are combined.

Jenner Hoskins,¹³ in speaking of the medical complications of prostatectomy, says that it is not uncommon in prostatic obstruction to find the cardiovascular system seriously damaged. Hyperpiesis is not a contra-indication to operation, but patients with a low blood-pressure, and especially those with myocardial degeneration, stand even a small loss of blood very badly.

Technique.—The technique of suprapubic prostatectomy has been greatly elaborated and perfected during the past few years. Many surgeons are now practising, in addition to an open operation whereby the prostate is enucleated under vision and bleeding points are accurately ligated, a plastic reconstruction of the prostatic bed. A few operators go further and completely close the suprapubic bladder wound, and rely upon an indwelling urethral catheter for drainage. The objection raised to closure of the bladder can be refuted by the good results of those surgeons now employing this method, and a leaking suppurating cystostomy wound should now be a thing of the past. (H. Harris,¹⁴ J. C. Sargent,¹⁵ A. H. Peacock.¹⁶)

Survival After Prostatectomy.—W. S. Dickie¹⁷ reports a case of a patient who lived twenty-three years after prostatectomy and died at the age of 93. C. R. McCash¹⁸ has traced Sir Peter Freyer's series, and finds that 31 per cent of the 82 prostatectomized patients lived ten years or longer and several attained the age of 90.

Prostatic Calculi.—G. Luys¹⁹ has found that if trenches are dug in the prostatic urethra by endoscopic electro-coagulation, prostatic calculi are freed and are spontaneously eliminated in a few days when the eschars become detached. T. Millin²⁰ has also found this method effective in a case of multiple calculi in the prostate.

Carcinoma of the Prostate: Treatment with Radium.—Gilbert Smith²¹ states that total removal of the prostate by the perineal route is the best method of treating carcinoma of the organ providing the case is seen before the growth has broken through the prostatic capsule. When the growth has advanced too far for radical removal, radium appears to be the best treatment. The bladder is drained by a catheter until the renal function is satisfactory. Suprapubic cystostomy is then performed, and, guided by a finger in the rectum, radium seeds are implanted into the prostate. The needles are inserted into the prostatic tissue from above until their points are almost directly under the rectal mucosa. Prolonged suprapubic drainage of the bladder is essential, for an intense cystitis usually follows. The dosage is usually from 3500 to 5000 millicurie hours. The results of the treatment are on the whole satisfactory, though many of the patients so treated are permanently incontinent.

REFERENCES.—¹*Amer. Jour. Surg.* 1931, Aug., 34; ²*Ibid.* 29; ³*Lancet*, 1932, June 11, 1246; ⁴*Brit. Med. Jour.* 1932, ii, 842; ⁵*Lancet*, 1932, i, 1243; ⁶*Calif. and Western Med.* 1932, Feb., 76; ⁷*Proc. Roy. Soc. Med.* 1932, Jan., 269; ⁸*Calif. and Western Med.* 1932, Feb., 77; ⁹*Hoffmeister, Deut. Zeits. f. Chir.* 1932, Feb., 320; ¹⁰H. C. Bumpus, *Brit. Jour. Urol.* 1932, iv, 106; ¹¹*Brit. Med. Jour.* 1932, ii, 192; ¹²*Ibid.* 197; ¹³*Clin. Jour.* 1932, Feb. 3, 49; ¹⁴*Brit. Jour. Urol.* 1929, Sept., 185; ¹⁵*Jour. of Urol.* 1931, Nov., 639; ¹⁶*Jour. Amer. Med. Assoc.* 1931, Dec. 12, 1768; ¹⁷*Brit. Med. Jour.* 1931, Oct. 17; ¹⁸*Ibid.* ii, 989; ¹⁹*Bull. et Mém. Soc. Chir. de Paris*, 1932, March 4, 152; ²⁰*Proc. Roy. Soc. Med.* 1932, Jan., 274; ²¹*New Eng. Jour. Med.* 1931, Nov., 1040.

PRURITUS ANI.

J. P. Lockhart-Mummery, F.R.C.S.

ETIOLOGY.—The cause of pruritus ani apart from local lesions of the anus or rectum has been the source of much discussion. There are a large proportion of cases of this condition where the most careful examination fails to reveal any local lesion except what can be accounted for by scratching. W. P. MacArthur¹ believes that *Enterobius vermicularis*, one of the nematode worms often found inhabiting the human intestine, is a not uncommon cause of pruritus, and that this cause may be easily missed for years. This worm's normal habitat is the appendix, and the gravid females make their way to the anus to oviposit. It is their movements which cause the irritation. The patient is constantly reinfecting himself from his fingers which pick up the ova when scratching the parts. The itching usually occurs at night, and examination of the stools will fail to demonstrate the presence of the parasite unless a rectal wash-out given at the time when there is bad itching is examined. Even then the worms are very easily missed and repeated examinations may be necessary before they are detected. Treatment consists in washing out the rectum at the time when the irritation is present (and, therefore, the female worms may be assumed to be present in the rectum) with a solution of two tablespoonfuls of Salt to the pint; 4 oz. of this solution should be injected. It is also very important that the patient should not reinfect himself, and scrupulous care is necessary to secure this. Anti-worm remedies may also be administered, and of these MacArthur advises 2 gr. of Santonin with $\frac{1}{2}$ gr. of Calomel.

Local Applications.—Ointments are very popular in the treatment of pruritus ani, chiefly on account of their convenience, and the ease with which they can be applied. They often give immediate relief from the itching, and on that account are preferred by patients, but they are objectionable in that they tend to keep the skin damp and sodden, and although they relieve symptoms they very seldom affect a cure of the condition because they tend to keep up the unhealthy state of the skin, which is often the cause of the trouble. The following are very satisfactory ointments for the purpose:—

R Hydrarg. Subchlor.
Bismuth. Subnit.
Tinct. Aconiti.

3ij
3iiss
min. viij

Glycerini
Unguent. Sambuci

3ij
ad 3j

R	Tinct. Benzoini Co.	℥ij	|	Lanolini	ad ℥j
R	Mentholia Bismuthi Nitratis	gr. v ℥ss	|	Lanolini	℥j

R Ung. Perceinal (Ciba)

In many cases much better results can be obtained by lotions and powders, as they tend to dry and harden the skin and gradually to get rid of the thickening and inflammation which keeps up the irritation.

If the skin is much excoriated and eczematous, only very mild and non-irritating solutions should be applied at first. There certainly will be a number of fissures and cracks which will cause stinging and pain if any irritant solution is applied. When there is an acute eczematous condition present, it is better to start with weak solutions of **Lead** or **Zinc Oxide** applied on butter muslin, and to avoid washing or baths, until the acute condition has passed. Sedatives should be administered to allow the patient to sleep and to allay the tendency to scratch or rub the parts, which is often very intense. After the acute inflammation of the skin has subsided the parts should be kept well dusted with a non-irritant powder. A powder consisting of equal parts of **Calamine and Starch** is very suitable. Alkaline lotions are generally the best in cases of pruritus, and the following lotion is often most useful:—

R	Pulv. Cretæ Prop.	℥iij	|	Glycerini	℥ij
	Pulv. Calaminæ Prop.	℥iij	|	Aquam Rosæ	ad ℥vj
	Liq. Calcis	℥iij	|		

It should be well dabbed on over the whole area after washing with cold water after the bowels act, and before retiring to bed. A lotion consisting of equal parts of **Glycerin Thymol Co.** and water is also very useful in some cases.

Alcoholic Solutions often give great relief, but must not be used if there are cracks or fissures, as they will cause considerable smarting. The following has often proved useful:—

R	Friar's Balsam	℥j		Purified Spirit	℥j
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This should be applied with the finger.

Operative Treatment.—In bad cases of pruritus ani no kind of local application seems to give any but quite temporary relief, and the patient's life becomes miserable from constant loss of sleep. The best treatment for such cases is the operation devised by the late Sir Charles Ball, which is designed to divide all the nerves passing to the affected area of the anus and anal margin. The nerves are divided just beneath the skin by turning up flaps, which are afterwards sutured back into place. As the result of the operation there should be complete anæsthesia of the whole pruritic area, which lasts about six weeks. At the end of that time new nerve-fibres grow into the skin and sensation re-establishes itself, but as these nerve-endings are not involved in the fibrotic tissue the irritation does not return. This operation has been performed for many years at St. Mark's Hospital and has given excellent results. There is no danger attached to it, and it does not leave any deformity or disability behind, as is the case when the skin is cut away or cauterized. It is, however, rather a difficult operation, as the nerves can easily be missed, and the external sphincter can be damaged if care is not taken.

X Rays and Radium are often used in these cases, but they are not safe. While they relieve the itching in some 20 per cent of cases, they quite fail in the remainder, and there is a serious risk of causing X-ray burns. Ball's operation is much safer than X rays and gives uniformly good results.

Autohæmotherapy.—M. S. Shaine¹ suggests a curious form of treatment for pruritus ani, which he calls autohemotherapy. It consists of injecting 5 to 10 c.c. of blood from the patient's vein into the buttock once a week. It is said that this treatment is sometimes attended by dramatic success. For local application he advises **Nitrate of Silver**, 3 to 5 per cent, two or three times a week.

REFERENCES.—¹*Brit. Med. Jour.* 1931, ii, 334; ²*Med. Jour. and Record*, 1931, Sept. 16, 295.

PSORIASIS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

O. L. Levin and S. H. Silvers¹ discuss the treatment of psoriasis by means of a **Salt-free Diet**. They point out that it has been observed that the lesions of psoriasis do not sweat; that the acidity of the sweat of psoriatics in other areas than those affected by the disease is increased; and that there is a higher concentration of chlorides in the sweat. They think that in the psoriasis patch, and probably in skin areas not yet affected, the cellular metabolic rate of the epidermis is greatly increased, resulting in the setting free of an increased quantity of CO₂. The CO₂, which as H₂CO₃ is taken up by the connective tissues, sets free the chlorine ion, thereby increasing the local acidity. This is probably responsible for the increased acidity in psoriasis. The remedies at present employed in this disease all have a tendency to increase the local blood-supply by their irritative action, thereby increasing the alkalinity of the tissues.

The authors placed their patients on a salt-free diet with abundance of vegetables and fruits. This diet is alkaline and rich in vitamins. Sweat baths were used to hasten the elimination of the salt, and local applications of grease were used to make the patients more comfortable. The results in three cases recorded were favourable.

REFERENCE.—¹*Med. Jour. and Record*, 1931, Aug. 19, 179.

PSYCHONEUROSES.

H. Devine, M.D., F.R.C.P.

Psychalgia.—J. H. Pratt, L. A. Golden, and J. Rosenthal¹ have made a prolonged study of the frequency and characteristics of the *psychalgias* by means of the procaine skin test and by the effects of suggestion. This contribution includes a useful historical survey of the literature dealing with the psychalgias. Though Brodie was the first to show that widespread tenderness of the skin is of such great importance in the recognition of hysteria and other neuroses, he was not the first to discover that tenderness is a symptom of the neuroses. Sydenham, in his description of hysteria, after mentioning the frequency of pain in various parts of the body, including the teeth, states that "the place on which they were, cannot bear touching after they are gone, but is tender, and aches just as if it were beaten soundly, but this tenderness goes off by degrees". To Blocq belongs the credit of first clearly recognizing that the localized pain that occurs in so-called neurasthenia is of central origin. The work of Weiss and Davis² on the nature of visceral pain brought to the notice of the writers a new method of studying these pains of psychic origin. They found that injecting with procaine hydrochloride the localized area of skin where pain in visceral disease was referred, abolished the pain completely while the anaesthesia lasted. The following methods were used by the writers in their research:

In 55 cases the skin over the area where the pain was most intense was injected with a 2 per cent. procaine solution. Care was taken to produce a well-marked wheal, and injection of the subcutaneous tissue was avoided. The infiltration rarely covered an area larger than 3 cm. in diameter, and

usually only from 2 to 4 c.c. of procaine was used. In many instances only a portion of the painful area was injected.

To study the effect of suggestion alone, the hypodermic needle was inserted into the skin but no procaine was injected. This was done in 55 cases, the same number as in the procaine series. The patient was asked to point out the place in the surface of the body where the pain was most severe. This was disinfected sometimes with alcohol, sometimes with iodine or mercuriochrome-220 soluble. Frequently a syringe was filled with a solution in the sight of the patient; in some tests, the direct suggestion that the pain would cease was given to the patient, but in many others the patient was not told the purpose of the test.

The following is a summary of the results obtained in this study: In all, 110 cases were investigated. Only 2 of these showed definite organic disease, one being a case of pleurisy and pneumonia, and the other intercostal neuralgia due to herpes zoster. In 95 of the cases, the pain was completely removed. The success with the needle alone was equal to that with the procaine injection. In 8 cases there was partial relief from pain, in 7 the procedure failed, in a few instances even increasing the pain. The injection of a small area often caused the pain from a large area to disappear. In 45 cases freedom from pain lasted from one to eighteen months, while in visceral disease studied by Weiss and Davis and by Rudolph Smith, pain always returned within twenty-four hours, and usually within from two to six hours. In 22 cases there was no pain for five days or more following the test. The pains were located in all parts of the body. The most common location was the back, and next in order of frequency the abdomen. The part of the abdomen most usually affected was the right lower quadrant. No less than 11 per cent of the total number of cases might have been mistaken for chronic appendicitis. These results show the frequency of the psychalgias. They confirm Sydenham's statement in regard to hysteria that "this disease, if I calculate right, most frequently occurs of all chronic diseases".

'Traumatic Neurasthenia.'—M. Culpin³ points out how misleading and harmful this commonly used term may be, in that it suggests that an injury or shock may of itself set up a physical and enduring injury to the nervous system without any demonstrable morbid anatomy. Many legal judgements are based upon the belief that there is such a disorder which, having a name, is part of the established order of things and in no need of further definition. Culpin takes the view that an anxiety state can follow various kinds of shock in the absence of the compensation factor. In many cases that come to the stage of compensation the anxiety state occurs first, and is then neglected and allowed to develop, so that the unfortunate patient is given no alternative but to devote all his energies to the obtaining of compensation. The fears that make up much of the symptoms of an anxiety state are not imaginary (whatever that may mean), but to the sufferer as real as any toothache. He sees in them proof of damage to his nervous system (whatever that, too, may mean), and is compelled to cling to compensation as his only safeguard for the future. In cases that are treated early enough the man may eagerly grasp at a correct presentation of his state, seeing a gleam of hope hitherto absent through the belief in some mysterious injury to his nerves. Culpin's work for the Industrial Health Research Board has satisfied him that there is in the working population a reservoir of people who, suffering from symptoms that interfere only slightly with happiness and efficiency, are nevertheless ready to fall victims to any pseudo-neurological disorder that may offer itself. That disorder, though called into being by immediate causes, is intimately linked with the previous condition, and, if left to develop, becomes

consolidated with it. Thus a traumatic neurasthenia is identical in its general structure with those other disorders for which psycho-analytical principles offer a pathology and a means of treatment; it differs from them in the influence of compensation in conjunction with the anxiety patient's fears about his economic future. An accident; some more or less severe anxiety symptoms; a false pathology accepted by doctors, lawyers, and the public; a lively apprehension about the future, together with compensation in place of understanding and rational treatment; these make up a combination that has brought many a decent citizen to disaster. The views expressed are exemplified by reference to a number of compensation cases dealt with by the writer.

E. L. Pope⁴ points out that politics and political power have been gradually forced into an overwhelming degree of paternalism, perhaps more pronouncedly in England than elsewhere, but with immigration the influence has spread westward—the writer here referring to his experience in Canada. This finds expression in the enormously increasing claims for compensation, and is based upon an ever-increasing sense of hetero-responsibility. This product of our complex civilization is found in its most luxurious form in the following relationships: Suits for damages against corporations, professional men, and wealthy individuals; claims upon sickness and accident liability insurance companies; claims under the Workmen's Compensation Act; and claims upon governments for pensions for disabilities alleged to be due to war service. The pinch of economic conditions has led to a great increase in such claims. The writer points out that to suggest that a man is a malingerer, a valetudinarian, or a neurotic, is only to court disaster in future professional relationships. He suggests, therefore, that a way out of such an impasse is the introduction of a newly-coined Greek term. The term suggested is 'scolio-pathexis', the literal meaning of which is 'a twisted or perverted state of mind in relation to disease'. It is suggested that, while not entirely euphemistic, it is at least polite. Moreover, it is respectful and believably devoid of stigma. It courts respect because it contains nothing to signify a sinister or unworthy motive. With such a label the physician is in a better position to offer a good prognosis and he is in a much better position to effect a cure in an amicable manner. There is, indeed, a sense of humour involved, which enhances the cordiality, and which is so much more advantageous than that brow-beating attitude of mind that is so likely to assert itself in one who has discovered, or thinks he has discovered, an attempt, conscious, subconscious, or unconscious, to misrepresent something to him. It helps to effect a friendly compromise. A provocative impasse is less likely to occur. The writer points out that the medical man can hardly escape the recognition and acknowledgment of his tremendous responsibilities in bolstering up the State in its hour of need. The biological result of the demasculinization of man is social chaos, and it may be admitted that a very large element of the remedial process lies within our hands. The writer suggests that this can be effected in the following ways: (1) By a rigid sense of responsibility in lifting our patients out of their disabilities at the earliest possible date, and before they have lapsed into the mire of scolio-pathexis; (2) By a firm resistance to the temptation of seeking undue rewards from a situation that is largely under our command; and (3) By the discouragement of the sense of hetero-responsibility that is so liable to complicate recoveries and induce an obstinate form of scolio-pathexis. It is pointed out that the attitude of the physician or surgeon first in attendance upon a case of trauma has a tremendous effect in the creation or prevention of scolio-pathexis. One indiscreet remark may lead to a prolonged or unnecessary removal of an individual from his work-a-day environment, with consequent economic loss and drain upon the funds of

industry and government. It is a pathetic picture when we see a strong, rugged man demasculinized by a relatively slight disability, through failure to apply a little optimistic psychology at the proper moment. A word or gesture at the right instant may prevent a long chronic disability, largely endogenous, that may require weeks, months, or years to rectify for the want of such timely influence.

Pope summarizes the subject of scoliopathesis as follows: Scoliopathesis is a disability, but not a pensionable or compensatable one. It can be largely prevented by mental hygiene and psychotherapy administered early and often in case of trauma and disease. Surgeons should not be content to leave this form of therapy entirely to internists and neurologists, but should include it as a fundamental measure in their own therapeutic armamentarium. A knowledge of the practical workings of such important statutes as the Workmen's Compensation Act should be included in the curricula of the medical schools in order that future co-operation of the profession may be assured. Practical demonstrations might well be included in medical curricula in order that the profession may give satisfactory expert evidence in law courts. Practical psychotherapy and mental hygiene should be given a place in the teaching of clinical therapeutics. It is believed that such a step would bring the profession and the laity nearer to a mutual understanding, thus giving a death-blow to cults of irregular medicine. The legal discontinuance of pensionability for the so-called neuroses would probably lead to the elimination of the great deal of valetudinarianism that frequently masquerades under a more euphemistic name, and would necessitate more definite clinical grounds as a basis for compensation. The erroneous concept of *post hoc ergo propter hoc* should be discountenanced emphatically by the profession, in order to clarify medical disabilities in the minds of juries, commissions, and tribunals. The medical profession should be prepared to stampede this concept when it crops up in compensation-conscious patients.

Such contributions as the above serve to emphasize the necessity for an increasing knowledge of psychological medicine and psychotherapy on the part of the medical profession as a whole. This point is emphasized by M. Fremont Smith⁵, who writes an article on guides to the prevention and treatment of the simpler neuroses. The writer points out that in this day of over-specialization the practitioner holds a unique position in medicine. He alone is privileged to consider his patient as a whole; to investigate without prejudice not only the body, but the mind; and if an explanation for symptoms is not found after appropriate physical examinations, to seek their cause in the patient's environment. If he does not exercise this prerogative, a valuable opportunity has not only been neglected, but more often irreparably lost. The patient who leaves his doctor's consulting-room with psychogenic symptoms unrecognized travels thereafter like a derelict from one specialist to another, and often finally reaches the charlatan, who at least takes the symptoms at face value and offers hope of cure. The practitioner often fails to accept this responsibility and makes no adequate study of the patient's emotional life because, firstly, most internists believe that all cases of neurosis demand a great many hours of treatment, and he thinks that neither he nor the patient can afford the time; secondly, he does not know what to say, how to get at the facts, or what to do about them when discovered.

With full recognition that prolonged treatment is essential in many cases, it is the belief of the writer that a very large proportion of these patients can and must be helped by the practitioner if they are to be helped at all. Complete cure, which would imply entire self-understanding, certainly is often not obtained; but relief from symptoms will result in numerous patients, after

a very few hours' work. Even if entire relief is not secured, the subject of psychotherapy will be opened up. The patient at least partially understands his problem and may accept a suggestion that he continue further with a psychiatrist the work already begun. The physician's greatest stumbling-block is lack of thorough psychiatric training. This defect in medical training is not insuperable. The internist cannot undertake a complete psycho-analysis, but he should be able to understand the various types of difficulties underlying neurotic symptoms and should have a practical knowledge of the simpler methods of therapy. At the outset both the physician and patient must be convinced that organic disease does not exist, or if it be present, that it cannot wholly explain the symptoms. The patient, moreover, must be made to feel that his physician believes his symptoms to be real—as indeed they are—not imaginary, as they so frequently are labelled even to-day. Lastly, the physician must be able to explain how real symptoms can occur in the absence of organic disease, and must uncover, if he can, the sufficient cause for symptoms in his patient's unconscious emotional life.

In this paper the writer contents himself with outlining the different mechanisms of neurosis, such as it would be necessary to point out to the patient. To make the patient aware of the fear or unconscious conflict responsible for his own difficulty is the important step. By asking him to recall his earliest memories, by investigating his relationship to other members of the family, by inquiry into the sex education and experiences, this can usually now be accomplished. The patient may often be brought to realize that his situation is in fact a very natural one, perhaps the inevitable result of early experiences and the repressions which have followed in their wake. If it is found that the patient's unconscious goal has been to preserve at any cost a sense of superiority necessitated by a false goal in life, and if such a patient can be made to realize that peace of heart should depend upon his doing the best he can and not upon personal perfection, the neurosis, no longer necessary for the protection of self-esteem, vanishes.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, Feb. 6, 441; ²*Amer. Jour. Med. Sci.* 1928, Oct., 517; ³*Lancet*, 1931, ii, 233; ⁴*Canad. Med. Assoc. Jour.* 1932, Jan., 40; ⁵*Amer. Jour. Med. Sci.* 1931, Aug., 261.

PSYCHOSES, PATHOLOGY OF.

H. Devine, M.D., F.R.C.P.

Blood-sugar in Abnormal Mental States.—P. K. McCowan and J. H. Quastel^{1, 2} are responsible for a research on this subject. The communication is based upon a careful examination of 85 patients, each of whom has been investigated on a number of occasions. The writers point out that the commonly used term 'abnormal sugar curve' is vague, and may apply to cases where the blood-sugar has risen to excessive heights, and yet fallen to a normal fasting level within two hours; or to cases where the blood-sugar has risen in a normal manner, but has *not* fallen to the fasting level within two hours; or to cases where the blood-sugar has scarcely risen at all. It was quite obvious to the writers that the abnormality, as a general rule, exhibited itself as a sustained hyperglycæmia. This did not mean that the blood-sugar necessarily rose to a higher level than that which obtained in normal cases, but that it did not return to normal within two hours. This was the most constant finding in all abnormal sugar-tolerance curves. It seemed, therefore, that a quantitative expression of the extent of the abnormality of the sugar curve could be found in the length of the delay to return to the normal fasting level. The most abnormal condition of the curve would be when the sugar level was at its *highest* value at the end of the two-hour period; and the curve would be deemed normal when the sugar level had returned to the

fasting value at the end of the period. A quantitative expression of *sustained* hyperglycæmia exhibited in an 'abnormal' curve can be given as follows :—

$$\text{H.I.} = \frac{\text{Two-hour blood-sugar level} - \text{Fasting level}}{\text{Maximum blood-sugar level} - \text{Fasting level}} \times 100$$

where H.I. represents the measure of *sustained* hyperglycæmia, and is conveniently referred to as the hyperglycæmic index. The maximum blood-sugar level is the maximum level to which the blood-sugar rises within two hours of ingestion of glucose. It will be seen that the index is 100 when the blood-sugar level has, after the two-hour period, only just (or not yet) reached its maximum peak after the sugar ingestion. It is zero when the curve is a normal one. The sugar tolerance was investigated in 6 male and 6 female nurses; 52 patients suffering from manic-depressive psychosis, including involutional melancholia; 5 cases of benign stupor; 19 schizophrenics; 7 cases of arteriosclerotic dementia; 7 patients who were menstruating; 3 patients who had recently been vaccinated; and 1 case to study the effect of toxæmia on the H.I.

Several important conclusions were reached as a result of this research :—

1. In the *manic-depressive group* there is the closest parallelism between the magnitude of the H.I. and the emotional tension of the patient. Out of 43 melancholic patients examined, only 10 gave a normal or slightly abnormal index. This low H.I. was attributed to the fact that the patients concerned exhibited a considerable hysteroid element in their psychoses. The high H.I. found in the majority of these patients is attributed to the emotional tension which, as Cannon has shown, is accompanied by an outpouring of adrenalin as a defensive mechanism, and the presence of this substance in the blood would certainly account for a sustained hyperglycæmia after sugar ingestion. This finding should be of considerable value to the clinician from the standpoint of prognosis : (a) *On admission of a patient* suffering from manic-depressive disorder a high index would indicate considerable emotional tension. If the index and the clinical behaviour do not coincide there would be reason to suspect a hysteriform element in the patient, and, from the results obtained in this research, this would indicate a bad prognosis. (b) *Just before discharge of the patient.* The index should be zero on discharge. Even if the clinical condition would seem to warrant discharge, it may happen that the index is high; and thus the discharge of the patient would be attended with considerable risk. A number of zero indexes obtained prior to the discharge of the patient appears to be the most reliable indication of recovery.

2. In cases of *mania* a low index is recorded, except when the excitement is accompanied by an aggressive paranoid mood. In cases of *benign stupor* the index is low, showing that the defence mechanism of the stupor reaction has succeeded in abolishing the emotional tension.

3. *Arteriosclerosis per se* is not a cause of high H.I.

4. During menstruation there is a departure from the normal sugar-tolerance curve in both normal and psychotic cases.

5. In the *schizophrenic group* there is a relatively low incidence of patients (2 out of 29) showing an index consistently greater than 50. High figures in this group are associated with toxæmia, endocrine imbalance, or other physical disorder.

Using the technique of McCowan and Quastel, R. Strom-Olsen³ has studied the H.I. in 36 psychotic cases. In summarizing his results the writer states that the interpretation of glucose-tolerance tests in mental patients is one of great complexity, and in each case several factors may require to be taken into account. From the results obtained in this research it would appear

that under-nutrition *per se* plays a very important part in the production of a high H.I., and due allowance must be made for this state. Furthermore, it is well recognized that the presence of certain organic diseases, especially endocrine affections (diabetes mellitus, hyperthyroidism, etc.), hepatic and renal insufficiency, and marked cardiovascular degeneration have to be considered, as well as the physiological disturbance of menstruation and the emotional state at the time of the test.

Interesting confirmation of the view that the rise in the H.I. of psychotic patients is evidence of emotional tension is supplied by Madeline H. Lockwood⁴ in a study of the psycho-galvanic reflex in a number of mental cases of various types. It is generally known that the psycho-galvanic or skin reflex is an inevitable response outside voluntary control which can be used to supply objective evidence of affectivity. The reflex depends upon a lowering of the skin-resistance to the passage of a constant current. In all the cases investigated there was found to be a striking parallelism between the H.I. and the galvanic reactivity. It was found that states of increased emotional tension, and consequent increased galvanic reactivity, are associated with a sufficient increase of functional activity to cause a rise in the H.I. Further, where the subjective signs of emotion were associated with a normal or decreased affectivity, there was no increase in the H.I. Like the H.I., the affectivity as shown by the psycho-galvanometer is found to depend, not upon the type of psychosis, but upon the degree of emotional tension present at the time of the test.

Pathology of Schizophrenia.—W. Malamud and D. Rothschild⁵ have made an investigation of the *distribution ratio of bromides in schizophrenia*. This research is part of an investigation of the barrier between the blood and cerebrospinal fluid. The writers studied 210 cases. In schizophrenia uncomplicated by somatic diseases 60 per cent of the cases showed ratios above 3.2 (up to 4.3), 38 per cent ratios between 2.80 and 3.20, 2 per cent ratios below 2.80. This is also true of schizophrenics who have a positive blood-Wassermann, but no signs of neuroles. Active tuberculosis, cerebral arteriosclerosis, acute infections, and reactions to typhoid inoculations all tend to increase the passage of bromides into the cerebrospinal fluid, i.e., to decrease the ratio. No definite relationship was found between the distribution ratio and the type of schizophrenia, as usually classified. A large proportion of schizophrenics with ratios between 2.80 and 3.20 ran acute courses with good remissions. The few cases (2 per cent) with a ratio below 2.80 showed rather passive, decompensating types of schizophrenia.

W. Freeman⁶ writes on the *deficiency of catalytic iron in the brain of schizophrenics*. The research included the histochemical examination of the brains of a variety of psychotics, and at the same time the estimation of the amount of iron present in the various groups. The average iron content is slightly lower in the schizoid group than in the paranoid and cycloid group. There was both histochemically and quantitatively a deficiency of iron in the cortical ganglion cells. The lack of the catalytic agent, so essential to the utilization of oxygen by these cells, may underlie certain features in the symptomatology of this psychosis.

W. Speilmeyer⁷ discusses the difficult problem of the *anatomy of schizophrenia*. The writer points out that there are three sources of error in investigations of this problem. First, that the changes so often found are the results of bodily disease—the small nerve-cell-free zones and lighter strands in the cortex occur in normal individuals, e.g., in cases of accidental death. Secondly, he has also found copious fatty substances in glial cells and vessel walls in young healthy subjects. Thirdly, he has found fresh necrobiotic

areas in a variety of conditions—intoxications, infections, etc.—and he does not consider these pathognomonic of schizophrenia. The positive findings, however, he considers to be a cellular loss in the third layer of the cortex as well as the deeper layers, sometimes with an enormous accumulation of fat. He considers these findings only indicate the organic nature of schizophrenia, but not the anatomical diagnosis and the differential diagnosis, which are so greatly needed.

C. B. Bamford and H. Bean⁶ have made a histological study of a series of acute dementia præcox cases. The writers reach the conclusion that there is no characteristic histopathology of the brain in dementia præcox. The most constant finding was a condition of fibrosis affecting the solid viscera, demonstrable both macroscopically and microscopically. The kidney first, and the spleen second, bore the brunt of this fibrosis, and these two organs invariably showed the effects of this process microscopically. The other organs were affected to a lesser extent and tended to exhibit individual variation. In the experience of the writers the usual order of involvement is: liver, adrenal, testis or ovary, thyroid, pancreas, pituitary, pineal gland.

R. G. Hoskins⁷ points out that schizophrenia, representing as it does a distortion of the whole personality, offers a problem that is co-extensive with that of human psychology. Since the patient shows more or less characteristic deviations in his functional activities, the problem is also nearly co-extensive with that of human physiology. To whatever extent specific pathology may prove to play a part in the psychosis, that field of knowledge, too, is involved. It is obvious, therefore, that any attempt to deal productively with the problem literally 'as a whole' would be chimerical. No medical problem has been solved in that way, and to the practical investigator the actual problem is one of strategy—of selecting an angle of approach that offers most promise of significant returns for the labour involved. In a research in this field manifestations of the disorder at the physiologic level should first receive consideration. Several facts suggest the advisability of this approach. If, as many psychiatrists maintain, the mind-body antithesis is purely artificial, studies at the physiologic level are quite as 'psychologic' as at any other. The physiologic level is the one on which clear-cut, objective, quantitative data are most easily secured, and on which causality is most comprehensibly operative. Without subscribing to any simple conception of causality, one may mention several lines of evidence which indicate that somatic factors play a primary rôle in schizophrenia. The fact that the disorder shows a predilection for offspring of 'tainted' heredity can only mean that one or more 'susceptibility factors' are involved. It is here, no doubt, that the concomitant metabolic peculiarities have their significance.

The writer suggests that in a study of the physiologic status of the patient, cognizance may well be taken of the principle of *homeostasis* formulated by Cannon. This principle is, in effect, that the introduction of any distorting factor into a physiologic system promptly brings into play mechanisms to resist the distortion. Biologic existence in a shifting environment is only rendered possible by the operation of such factors. Widespread perturbations of physiologic processes are well-known features of schizophrenia. Are these due to the operation of overpowering and long-lasting distorting factors or to antecedent homeostatic inefficiency? In short, does the 'inefficiency' 'cause' the psychosis, or does the psychosis 'cause' the physiological perturbations? The most fundamental aspect of the schizophrenic problem is implicit in these questions. Here may be found the constitutional liability factor that has been postulated by many psychiatrists. The writer himself ventures the opinion that dementia præcox will prove ultimately to be characterized by

AN ANALYSIS OF THE DEMENTIA PRÆCOX PROBLEM.

ETIOLOGICAL FACTORS	DIAGNOSTIC PROCEDURES	THERAPEUTIC PROCEDURES
Emotional conflicts Withdrawal of interest in environment and transfer to phantasy life Bad mental and physical habits Industrial and social maladjustments	Intimate personal histories Psychologic tests Personality studies Controlled observations Environmental analyses	Psychotherapy Re-education Religious counsel Occupational therapy Industrial therapy Simplified environment Adjusted environment
Structural defects of body	Autopsies Biopsies Physical examinations Roentgen examinations Special tests	Adjusted environment Surgery Mechanical appliances Physical therapy
Defective brain metabolism	Carotid-jugular blood analysis	O ₂ - CO ₂ therapy Manganese Other metallic salts Gland therapy
Abnormal endocrine functions	Vital function tests Anthropometry Therapeutic tests	Gland therapy Roentgen therapy Diathermy Surgery
Autonomic nervous dysfunctions	Study of autonomic reflexes and reactions to test drugs	Sympathotropic and vagotropic drugs
Cardiovascular inefficiency	Efficiency tests	Symptomatic therapy Graduated exercise
Defective gastro-intestinal functions	Dental examinations Roentgen examinations Test meals Stool analyses	Dental therapy Diet Catharsis Massage Enzyme therapy Bacterial therapy Surgery
Liver dysfunctions	Liver function tests	Bile salts Duodenal lavage Diet
Abnormal mineral metabolism	Urine, blood, and stool analyses	Diet Salt therapy Gland therapy Heliotherapy
Disturbed acid-base equilibrium	Alveolar CO ₂ CO ₂ -combining power of plasma P _H studies of blood and cerebrospinal fluid	Diet Salt therapy
Vitamin deficiency	Physical examinations Roentgen studies Therapeutic tests	Vitamin therapy Heliotherapy
Infectious and surgical disease	Routine examinations Blood sedimentation tests Roentgen examinations Blood cultures Blood analyses Special tests	Special therapy as indicated
Other metabolic diseases	Ward observations Special examinations and tests	Special therapy as indicated

an abnormal homeostatic index. The kind of research required in the investigation of this problem is outlined by the writer in the scheme on p. 380. The study is initiated in each case with a social and medical case history and a detailed physical examination.

In this paper the details of this research project are outlined. The writer feels that this should include therapeutics. He considers this is in the interests of the patient, and if for no other reason it should be carried out. Furthermore, in some cases the most practical primary experimental procedure is to introduce a therapeutic variable and to study the resultant effects, metabolic and otherwise.

It would certainly appear that there are a number of somatic changes in the psychoses, though their significance is difficult to estimate. M. L. M. Northcote¹⁰ has made a comprehensive investigation of the bodily functions of thirty psychotic patients by means of clinical, pathological, biochemical, pharmacological, and radiological methods. She points out that while these investigations have failed to demonstrate any correlation between somatic and psychic abnormalities, or to produce any definite evidence to show that any particular psychosis is physiogenic in origin, the large proportion of minor abnormalities recorded is not without significance. While, the writer observes, it is relatively futile in the present state of our knowledge to add to the already too abundant hypotheses of mental disorders, it may be permissible to suggest that the obvious deviations from normal found in these investigations may have as their basis some changes in one or more of the fundamental biochemical reactions of the body, and especially of the central nervous system itself—changes, for instance, in tissue respiration and metabolism.

(See also DEMENTIA PRÆCOX, DYNAMISM IN.)

REFERENCES.—¹*Jour. of Ment. Sci.* 1931, July, 525; ²*Lancet*, 1931, ii, 731; ³*Ibid.* 1932, i, 128; ⁴*Jour. of Ment. Sci.* 1932, April, 128; ⁵*Arch. of Neurol. and Psychiat.* 1930, Aug., 348; ⁶*Ibid.* 300; ⁷*Jour. Nerv. and Ment. Dis.* 1930, Sept., 241; ⁸*Jour. of Ment. Sci.* 1932, April, 353; ⁹*Jour. Amer. Med. Assoc.* 1931, Sept., 682; ¹⁰*Jour. of Ment. Sci.* 1932, April, 263.

PULMONARY AFFECTIONS. (See INTRATHORACIC TUMOURS; LUNG, ABSCESS OF; LUNG, POST-OPERATIVE MASSIVE COLLAPSE OF; LUNGS, ACUTE ŒDEMA OF; LUNGS, CONGENITAL DISEASES OF; LUNGS, LIPIODOL INJECTIONS INTO; LUNGS AND MEDIASTINUM, PRIMARY GROWTHS OF; TUBERCULOSIS, PULMONARY.)

PULMONARY EMBOLISM. Sir W. I. de C. Wheeler, F.R.C.S.I.

In previous numbers of the MEDICAL ANNUAL the question of pulmonary embolism and its operative relief on many occasions has been discussed. K. Hosoi¹ gives a very complete review of the entire subject and comes to the following conclusions:—

1. Sixty-four verified cases of pulmonary embolism with or without infarction form the basis of the study. They consist of 25 post-operative, 3 post-traumatic, and 36 medical cases of embolism. This gives a necropsy incidence for embolism of 7.9 per cent, a mortality incidence of 2.1 per cent, and a morbidity incidence of 0.102 per cent.

2. Sex has probably no etiologic significance. The age incidence of embolic cases suddenly increases from forty years onward. Obese patients with embolism were all in this age liability group.

3. Embolism occurred in 0.09 per cent of the patients after general surgery and in 0.08 per cent after gynaecological surgery. Sixty-four per cent of the cases occurred in the first and second weeks post-operatively. The duration of symptoms from onset of pulmonary embolism to death varied from sudden

to ten days, 80 per cent dying by the third day. Sixty-eight per cent of the operations were in the lower abdomen. On the other hand, in medical embolism, the duration of symptoms was longer (as long as twenty-seven days) owing to the greater frequency of smaller emboli, occurring sometimes in showers. Furthermore, patients with medical embolism were not so severely affected, since only about one-third of them died within the first three days.

4. Forty-two per cent of the post-operative emboli lodged in the lower lobes, more often in the right, in the ratio of almost 2:1; 42 per cent in the main pulmonary artery or in one or both of its two branches, the right being favoured. Owing to the frequency of the embolism being less massive in medical cases, the emboli were able to reach the smaller branches of the pulmonary artery; in 64 per cent of the cases the lower lobes were involved. Medical infarction occurred more often in the left lower lobe than the right.

5. There was manifest infection in only 32 per cent of the post-operative cases, and in 50 per cent of the medical cases.

6. Infarction after embolism is liable to occur when there is an added circulatory congestive disturbance. The heart showed a varied pathology of hypertrophy, cardiosclerosis, and endocarditis. The hearts in the medical cases were uniformly larger, and 42 per cent of them showed severe lesions of hypertrophy and dilatation (decompensation). coronary thrombosis with infarction, vegetative endocarditis, and pancarditis. Infarction occurred almost twice as frequently after medical embolism as after post-operative embolism.

REFERENCE.—¹*Ann. of Surg.* 1932, Jan., 67.

A. Tudor Edwards, M.Ch., F.R.C.S.

Study of the aggregate incidence of fatal pulmonary emboli from the material of the Pathological Institute of Vienna (F. Kazda and W. Stohr¹) shows that fatal pulmonary emboli are more common in non-surgical cases than in those surgically treated. In over half the cases of post-operative fatal pulmonary embolism, lesions of the heart were found; in slightly less than 50 per cent, lesions were of the respiratory tract; in 30 per cent, changes in the spleen. The conclusion seems reasonable that operative trauma as a causation of post-operative emboli can be considered only as superimposed upon a fundamental embolic substratum and accompanying organic lesions. Fatal non-operative emboli have a pronounced seasonal incidence, mainly April, October, and November. It is noteworthy that the greatest number of post-operative fatal emboli were coincident with the influenza epidemic of 1918. The lower incidence of fatal post-operative pulmonary embolism during the war, it is suggested, is due to a lesser degree of adiposity, owing to relative starvation during those years.

REFERENCE.—¹*Deut. Zeits. f. Chir.* 1931, ccxxxi, 187.

PULSATING EXOPHTHALMOS.

A. Rendle Short, M.D., F.R.C.S.

We append an illustration (*Plate XXXVI*) of a case under the care of E. R. Chambers and the writer, in a young woman following a severe head injury. Some twenty-eight years ago the condition was extensively written up; since then very little has been published on the subject. About three-fourths of the cases follow an injury, the usual cause being a leakage of the internal carotid artery into the cavernous sinus. In most cases it goes on to blindness; a few get well spontaneously. The patient's principal complaint is buzzing in the head. The treatment usually adopted has been **Ligature of the Common Carotid**. The mortality is given as 10 per cent, but that includes many cases over fifty years ago. Only 4 out of 63 developed cerebral disturbances, and these were all in non-traumatic cases (Murray). In 6 patients out of 95 operated on (Sloman), blindness followed; the operation was late in all. In

PLATE XXXVI

PULSATING EXOPHTHALMOS



Showing the appearance of the affected (left) eye.

this series 49 were cured, 17 better, 17 no better, and 10 died. In the present case, the common carotid was tied by means of a strip of fascia lata. For the first few months the result was good, the eye receded, and the buzzing disappeared; but later on the symptoms returned. **Ligature of the Internal Carotid** was then undertaken, with the result that all the symptoms are greatly improved. There is very little in the literature to indicate what success or what risks attend the operation in such cases.

J. L. Campbell and J. D. Martin¹ describe a case, also due to trauma, which was treated eight months after the injury by **Partial Occlusion of the Internal Carotid** with an autogenous fascial band. The band was tightened until the thrill disappeared, but the lumen of the vessel was not completely occluded; it was estimated that there was 90 per cent closure. The fascial band was used with the idea of lessening the flow through the arterio-venous fistula in the hope of producing a thrombosis, while at the same time a small amount of blood would reinforce the collateral circulation and lessen the possibility of anæmia of the brain. The immediate post-operative results were good; cessation of the thrill and bruit occurred, but the exophthalmos remained unchanged. No circulatory disturbances in the brain followed. The patient returned to his work as a labourer, and five years later there had been no recurrence of thrill, bruit, or pulsation.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1932, ii, 1683.

PURPURA HÆMORRHAGICA. (See HÆMORRHAGIC DIATHESSES.)

PYELITIS AND COLI BACILLURIA.

S. W. Patterson, M.D., D.Sc., M.R.C.P.

J. G. Yates Bell¹ (London) discusses the treatment of this condition. In the acute stage the patient must be kept in bed, between blankets, on **Fluid Diet** but excluding milk—fruit juices, barley water, jellies are the most suitable—and given **Alkalis** with **Belladonna**. Chronic coli bacilluria follows delayed resolution of an acute attack or repeated exacerbations of a mild or latent infection. Infection as a result of enlarged prostate or stone in the bladder must be excluded. Assuming the infection to be 'primary', possible foci must be sought in appendix, diverticulosis of colon, nasal sinuses, tonsils, and teeth. The author uses three groups of treatment:—

1. *A combination of general hygiene, diet, and drugs.* Milk and red meats should be avoided, the **Diet** being made up of fruit, vegetables, carbohydrates, fish, and chicken. **Fluids** are given freely and **Lactose** with cultures of *B. acidophilus*. **Salol** 10 gr. or **Hydrargyrum c̄ Creta** ½ gr. may be used as intestinal antiseptics. The colon bacillus is inhibited by a strongly acid urine or an alkaline urine, and thus the drugs usually recommended find their significance. **Potassium Citrate**, **Potassium Bicarbonate**, and **Sodium Bicarbonate** are the alkalis used; **Acid Sodium Phosphate** (30 gr. t.i.d.), **Ammonium Chloride** (20 gr. t.i.d.), and **Ammonium Nitrate** (7½ gr. in a keratin-coated capsule) are the best acidifiers. With these are combined **Hexamine**, **Cystopurin**, **Methylene Blue**, or **Neutral Acriflavine**.

C. Rusche² (Hollywood) and H. Sugar³ (Los Angeles) have obtained good results with a new diazotized pyridin product (**Niazo**) given by the mouth in tablet form. For an adult 2 to 3 tablets of 0.1 grm. are given after each meal, and the best results follow when the patient limits his fluid intake to about 1½ to 2 pints a day. This preparation is also put up under the name of **Neotropin**. **Autogenous Vaccines** also have been advocated.

2. *Lavage of the renal pelvis* should be used in cases of failure of drugs and vaccines. After cleansing with sterile saline through a ureteric catheter, 4 c.c.

of 1 per cent **Silver Nitrate** or 5 per cent **Colloid Silver** is instilled into the renal pelvis. The treatment may be repeated at seven-day intervals. E. W. Schultz⁴ (San Francisco) advocated the use of **Bacteriophage**: approximately 5 c.c. of the undiluted *B. coli* 'phage should be instilled into the kidney pelves and at least 30 c.c. into the bladder, all in one dose. Of 151 chronic cases treated, 79 apparently failed to respond, while 72 were cured or definitely improved. Of the latter, 42 (28 per cent of the 151 cases treated) were clinical and bacteriological recoveries; 17 others improved but suffered from recurrences. E. Le B. Schottmüller⁵ (Hamburg) recommends lavage of the bladder with 2 per cent **Silver Nitrate** solution or 5 per cent **Targasin**⁶ solution, the latter being painless.

3. **Ketogenic diet.** The object of this is to produce an acidosis and so increase the acidity of the urine. This treatment originated at the Mayo Clinic in 1931 (H. Cabot,⁶ Rochester) and depends on the replacement of the carbohydrates in the diet by fats until ketones are present in the urine as indicated by the ferric chloride test. The following are details of a qualitative **Ketogenic Diet** giving approximately 2500 calories a day—carbohydrate 20 grm., fat 240 grm., protein 70 grm. C. M. Wilson⁷ (London) makes up the 240 grm. of fat with 10 oz. cream (40 per cent), 3½ oz. butter, and 2 oz. fat bacon, the remainder of the fat being taken in meat and eggs. The butter may be eaten with diabetic biscuits or used in cooking in a vegetable purée, in buttered eggs, or in an omelette. A vegetable cream soup or a fruit fool will only leave enough cream to be used up with tea or coffee. If it is desired to reduce the butter or cream, ½ oz. of olive oil night and morning will provide a substitute. The diet is distasteful, even disagreeable, but patients should be encouraged to persist with it for a week after the urine is sterile, to avoid relapses. The acidity produced by a ketogenic diet is more effective than an equal acidity produced by drugs. The acidity does not produce bladder irritation.

REFERENCES.—¹*Lancet*, 1932, ii, 805; ²*Amer. Jour. Surg.* 1932, March, 545; ³*Med. Jour. and Record*, 1931, July, 66; ⁴*Calif. and Western Med.* 1932, Feb., 91; ⁵*Münch med. Woch.* 1932, May, 863; ⁶*Lancet*, 1932, i, 1038; ⁷*Ibid.* ii, 960.

PYELOGRAPHY.

Hamilton Bailey, F.R.C.S.

Excretion Pyelography (Intravenous Pyelography).—This has now become a universally established method of investigating the urinary tract. The majority of observers consider that **Uroselectan B** marks the final stage in the development of this great advance, and the contrast shadows produced by this substance are heralded on all sides with supreme satisfaction. Uroselectan B is a pyridine derivative with 51.5 per cent organically bound iodine in an invert sugar solution (O. Dyes). Although the solution is hypertonic, the untoward symptoms of a hypertonic intravenous injection never occur; this is doubtless due to the presence of the invert sugar. Uroselectan B has the inestimable advantage over all other preparations that toxic symptoms following its administration are entirely lacking. Drawing pains along the veins are due to too rapid injection. In cases where excretion through the kidneys is insufficient the substance is excreted through the liver. Intravenous pyelography is therefore dangerous in uræmia, especially where in addition there is impaired liver function (A. von Lichtenberg).

Intestinal gas shadows obscure and spoil many films of the renal tract. German research workers have been engaged in overcoming this difficulty, and it seems probable that by the ingestion of suitable enzymes gas formation in

PLATE XXXVII

PYELOGRAPHY IN PREGNANCY

(D. BARR)

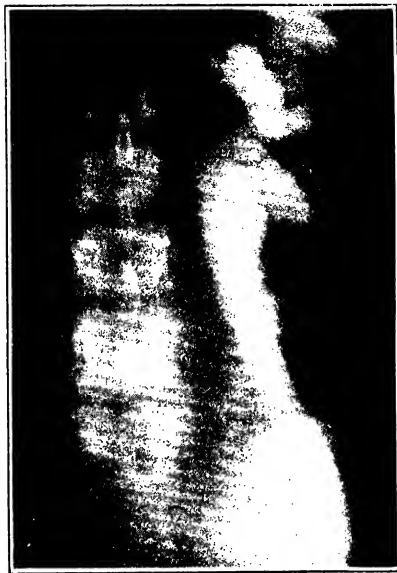


Fig. 28. - Pyelitis of pregnancy with toxæmia. Skiagram taken $1\frac{1}{2}$ hours after an injection of uroselectan B. The kidney function on the right side was so poor that no shadow was obtained.

the colon can be inhibited. **Luizym** is one of these enzyme products. It is put up in tablets, and two tablets are to be taken three times on the day before the radiological examination. On the evening before and on the morning of the examination enemata are given. H. Mezger found that in 94 cases prepared with luizym only 2 films were unsatisfactory, while in 94 cases without this enzyme preparation 19 were spoilt.

Intravenous pyelography is particularly valuable in children; C. G. Teall finds that for a child of 5 years one-third the adult dose is sufficient. Even infants can be examined by this method, and in no case has Teall injected less than a quarter of the adult dose, i.e., 10 grm. of uroselectan B. Intravenous pyelography has provided for the first time a practical means of visualizing the upper urinary tract in early childhood, and every case of pyuria in childhood which does not respond quickly to medicinal treatment should be investigated by this method.

Intravenous pyelography has also allowed a very complete study of the upper urinary tract in pregnant women. During pregnancy the ureters show definite but a variable degree of atony. D. Baird has seen this in very early cases of pregnancy long before pressure symptoms from the enlarged uterus could possibly be the causative agent, and B. Beuthner finds that ureteric dilatation is so constant that it might be used as confirmatory evidence in the diagnosis of pregnancy. During the second half of pregnancy the theory that the ureters are partially obstructed by the pregnant uterus appears to be confirmed (*Plate XXXVII*). Beuthner shows that the ureters during the eighth month of pregnancy are usually about the size of a man's little finger and the renal pelvis and calices are dilated. In normal pregnancy the tone of the ureters improves near term. It is especially interesting to note that Baird finds a minimum of ureteric atony and stasis in cases of albuminuric toxæmia.

Retrograde Pyelography (Instrumental Pyelography).—Although intravenous pyelography now occupies such an important place, instrument pyelography is still invaluable in many instances. A. Boeminghaus, in a comparison of the two methods, considers that they should be regarded as partners rather than competitors. E. G. Mark finds that a 20 per cent solution of uroselectan B gives better pictures than the usual 12½ per cent solution of sodium iodide, and it has the advantage of being far less irritating. Roller reports excellent results with a new contrast medium, **Thorotrast**,* prepared by the firm of Heyden. The substance is said to be inexpensive, and entirely non-irritating in character.

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PYLORUS, CONGENITAL STENOSIS OF.

John Fraser, Ch.M., F.R.C.S.Ed.

This disease forms the subject of consideration in a number of interesting papers. A good summary of the modern position is given by J. A. Douglas and B. G. von B. Melle.¹ In discussing the pathogenesis of the disease they refer to the interesting theory propounded by Wernstedt that congenital pyloric stenosis is a reversal to a sphincter type found in *Edentata*, and some

recent work in comparative anatomy has added fresh interest to this suggestion. The authors discuss in some detail the relationship between spasm and hypertrophy, concluding (probably rightly) that the superadded factor of spasm is the element which explains the acute phases of the disease.

Where treatment is concerned they are strongly in favour of operation, and they regard it as unfortunate that any degree of countenance should be given to perseverance in medical treatment. They practise the **Rammstedt Operation**, but they insist on the importance of most carefully regulated feeding in the post-operative period. They prefer breast milk, but, if this should not be available, they recommend the following combination: Buttermilk 2 parts, water 1 part, 5 per cent to 10 per cent dextromaltose. After a week the buttermilk is replaced by acidified full milk, and the increase in feeding is carried out in accordance with the progress of the infant.

E. Uhr,² quoting the work of Hildebrand, draws a contrast between two types in respect of pathology, a ring type and a more elongated spindle-shaped variety. The difference is purely a matter of academic interest, for no clinical distinction can be drawn between the two types. Uhr's paper concerns 73 cases and an operative mortality of 5.5 per cent. How great is the contrast between different operative statistics is shown by the fact that H. Kohl³ reports an operative mortality of 17.6 per cent in 63 cases. A point of special interest in Kohl's paper is the distinction which he draws between the results of medical and operative treatment; in the former there was a mortality of 30.4 per cent, while the latter was associated with a mortality of 17.6 per cent.

E. J. Donovan⁴ has something to say on the question of the etiology, and records the suggestive fact that he encountered the stenosis on two occasions in premature (seventh-month) babies. He is satisfied that the condition originates in the prenatal period, and regards it as a true hyperplasia of the circular muscle of the pyloric ring. In regard to treatment he is a believer in the value of **Pre-operative Transfusion**, and it is his custom to give in bad risks two transfusions of whole blood, 20 c.c. for each kilo of body weight. In addition each case receives 100 c.c. of 3 per cent **Glucose Solution**. Operation is carried out by the **Fredet-Rammstedt Method**, and in 119 cases there has been the highly satisfactory operative mortality of 5.9 per cent.

REFERENCES.—¹*Jour. Med. Assoc. S. Africa*, 1932, April 23, 259; ²*Deut. Zeits. f. Chir.* 1932, Jan., 58; ³*Ibid.* 1931, Oct., 466; ⁴*Ann. of Surg.* 1932, Feb., 174.

RADIOLOGY AND OBSTETRICS. (*See* OBSTETRICS AND RADIOLOGY.)

RADIUM TREATMENT OF CANCER. (*See* CANCER, RADIUM TREATMENT OF.)

RAYNAUD'S DISEASE.

A. G. Gibson, M.D., F.R.C.P.

E. V. Allen and G. E. Brown,¹ in a critical review of Raynaud's disease, come to the conclusion that, as in Raynaud's original monograph,² the following conditions are necessary for a diagnosis: (1) The gangrene which affects the extremities is unassociated with signs of arterial occlusion. The pulse never ceases to be perceptible, but there may be alterations such as vascular spasms in arteries of smaller calibre. (2) A tendency to symmetry in the lesions, the fingers of the upper limbs, the lower limbs, or all four limbs at the same time, and also the nose and ears. (3) The occurrence from time to time of local syncope; one or more fingers may be affected and become pale and cold suddenly. In some cases it is the same finger which is attacked, but the duration of the attack varies from a few minutes to many hours, and the cutaneous sensibility becomes blunted and finally lost. The temperature is lowered.

(4) Local asphyxia in which the pallor of the affected extremities is replaced by cyanosis—violet, slate-coloured, or even black. Following this a patch of red may be formed on the extremities of the fingers. This gives place to a normal pink colour, and the skin is then found to have returned to primitive conditions. (5) Gangrene may supervene on the cyanosis, and small phlyctenulæ appear on the digits at the extremity. The gangrene appears to be about to extend more and more, but the malady recedes, the parts become re-animated, and the small ulcer cicatrizes, contracts, and leaves a conical tubercle immediately subjacent to the nail.

The authors review Raynaud's original cases and show that some of these do not fall in with the criteria defined, and subsequent authors have been less careful to exclude cases obviously of a different category—thrombo-angiitis obliterans, embolism, and even sclerodermia. They have then reviewed a group of 150 carefully studied cases, and they are convinced that there is abundant evidence for a primary disease having the characters as defined by Raynaud. Secondary characters which they draw attention to are the predilection of the disease for females, and the absence of pain. This is so striking in most cases that when pain is present the diagnosis is seriously in doubt. It is necessary to exclude, in addition to the conditions mentioned above, neuritis, cervical rib, and arteriosclerotic disease.

TREATMENT.—R. G. Spurling, F. Jelsma, and J. B. Rogers³ refer to the current views as to the cause of the disease, especially Lewis's view that it is due to a local fault; with this they disagree because it casts doubt on the value of sympathetic nerve surgery in these cases. They present observations on three typical cases treated by **Sympathetic Ganglionectomy**. There was complete relief of symptoms in a case affecting the lower extremities and in one affecting the left upper extremity for periods from six to eighteen months. It is clear that there appears to have been relief following these operations which could not be accounted for by the natural evolution of the disease or by the benefit of hospital régime.

J. J. Morton and W. J. M. Scott,⁴ in a paper dealing with angiospastic syndromes, especially Raynaud's disease, remark that the essential abnormality is a local hypersensitiveness of the peripheral arteries to cold, and the spasm following the application of cold is not released by blocking the vasoconstrictor mechanism in the nerves. Yet this vasoconstrictor mechanism influence appears to be an important factor. Attacks of spasm are sometimes initiated by nervous factors, and the authors, regarding the results of their observations in nerve blockage, say they have not seen a case in which regional anaesthesia failed to cause some improvement in the circulation of the affected extremity, though in the severe cases the distal part might remain uninfluenced. The surgical removal of vasoconstrictor influences is in their opinion beneficial, and they consider that there is proper justification for surgery of the sympathetic system. On the other hand, to expect a cure in bad cases of Raynaud's disease is futile.

J. C. White⁵ discusses, with the experience of six cases, the efficiency of **Sympathetic Ganglionectomy** in Raynaud's disease by a study of post-operative conditions. Resection had been made of the two upper dorsal ganglia for the upper limb and of the second to the fourth lumbar ganglia in the case of the lower limb; both operations brought about an immediate paralysis of sympathetic tonus in each case. Permanent sympathetic paralysis followed a lumbar operation, whereas a recurrence of sympathetic function is recorded in the dorsal operation within a period of six months, and a recurrence of symptoms of the disease—colour changes, pain, coldness, and ulceration of the tips of the fingers. A block could be affected again by novocain or by a further

operation. Advanced stages with long-standing ulceration did not show more than partial recovery. To give an example, a woman of 29 with typical attacks of Raynaud's disease and four months of frequent pain in the right hand had resection of the first and second dorsal sympathetic ganglia on the left side. From the failure by exposure to heat to induce sweating in the right arm, shoulder, and upper chest it was inferred that the sympathetic block was complete. The symptoms in the right hand completely disappeared. In the course of eight months sweating returned slightly. The symptoms in the unoperated hand had slightly increased in severity, while her feet troubled her very little. Eighteen months later a marked recurrence of her old symptoms had taken place on the operated side. In another patient, aged 38, there was recurrence of all the old symptoms after sixteen months, on both sides. The operation, therefore, gives complete though temporary relief in the upper limbs and complete and permanent relief in the lower limbs.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1932, Feb. 187; ²*Local Asphyxia and Symmetrical Gangrene of the Extremities* (thesis for doctor's degree), 1862; ³*Surg. Gynecol. and Obst.* 1932, March, 584; ⁴*Ann. of Surg.* 1931, Nov., 839; ⁵*New Eng. Jour. Med.*, 1932, June 9, 1198.

RECKLINGHAUSEN'S DISEASE. (See VON RECKLINGHAUSEN'S DISEASE.)

RECTUM, CANCER OF.

J. P. Lockhart-Mummery, F.R.C.S.

Operative Treatment.—R. Gcuverneur and P. Oury,¹ in discussing the operability-rate for cancer of the rectum, found that out of 104 cases 55 were suitable for excision of one kind or another—an operability-rate of little over 50 per cent. This is about the same rate that is found in English and American hospitals.

Several surgeons describe modifications of abdomino-perineal excision of the rectum for cancer, enabling the operation to be performed in two stages, so as to diminish the risk. F. W. Rankin² describes an operation in two stages. At the first operation the colon is divided and the upper end brought out through a left loin incision to form a terminal colostomy; the other end is closed and dropped into the pelvis. After an interval of six weeks the rectum is dissected loose through a perineal incision and tied up in a rubber glove. It is left in the wound and the skin is closed. The patient is then turned on his back and the abdomen opened. The blood-supply to the rectum is ligatured and the upper attachment of the rectum divided and the rectum and growth removed through the abdominal incision. The peritoneal floor is restored by stitches from the abdominal aspect and the abdomen closed.

F. H. Lahey³ describes a very similar modification, but he brings the lower end of the colon out on to the abdominal wall just above the symphysis in the mid-line at the first operation. After an interval of two weeks he dissects out the lower end of the colon, after closing it with a purse-string suture, from the abdominal wall. After ligaturing the mesenteric vessels and freeing the rectum from the abdomen he pushes the stump into the cavity of the sacrum and re-establishes the peritoneal floor. The abdominal wound is then closed and the patient turned on his side. The rectum is now dissected out from below in the usual manner.

R. O. Coffey⁴ again describes his modification in which the blood-supply of the rectum is ligatured and the lower stump of the colon and upper part of the rectum are dissected free during the first, or colostomy, stage of the operation, and left in the pelvis. The peritoneum is closed over the pelvis and free drainage established with a rubber dam and gauze wicks. The second stage is performed a week or more later; an incision surrounding the anus is made and the whole rectum, stump of the colon, and surrounding tissues are removed

with the finger and scissors. As they are gangrenous from the cutting off of the blood-supply at the first operation this removal is easily carried out. The large wound which communicates with the drain through the abdominal wall is left open and packed with gauze.

It is claimed for these modifications that they decrease the risk because the colostomy is established sometime before the removal of the rectum. The objection to the first two methods is that they involve opening the abdomen twice, and the second laparotomy has to be performed with a colostomy opening quite near the abdominal incision. While the time gained by performing Coffey's modification over that required for the complete abdomino-perineal operation for removal of the rectum is not material, the chief objection to it is that it involves necrosis of the rectum and surrounding tissues, and involves a very large and septic wound, the avoidance of which has been the chief aim of rectal surgeons for many years. Also the gain in time as compared with a one-stage operation is probably not more than ten or fifteen minutes, which with a good modern anæsthesia, such as avertin and percain spinal anæsthesia, should not add materially to the patient's risk.

Two German surgeons, Professor Otto Goetze⁵ and Professor Poppert,⁶ discuss the relative merits of the abdomino-perineal route and the perineal two-stage operation for cancer of the rectum. Goetze uses a modified Kraske method with removal of the lower part of the sacrum but preservation of the periosteum, so as to prevent permanent damage to the pelvic floor, which is liable to result in hernia later.

Radium Treatment.—A considerable number of reports dealing with the treatment of cancer by radium have been issued during the year. In the report of the Medical Research Council just published, the results of treatment of rectal cancer with radium have been given from a number of the London hospitals. They make depressing reading. While in a number of cases the tumour has disappeared for a time, there is not a single case that can be justifiably claimed as a cure. The following quotation from the report is illuminating: "from experience gained in the most successful cases, it seems probable that it is necessary to employ such an intensity of irradiation that it will just avoid radio-necrosis . . . in the case of large growths the amount of radium employed will often make the patient very ill".

Sir Charles Gordon-Watson⁷ points out that though brilliant results can be obtained in early cases of cancer of the rectum by radium, these are too often followed by local recurrence. He does not consider that radium treatment is a satisfactory substitute for operative removal. He is opposed to abdominal radiation owing to the risk involved, although he quotes one successful case, where the patient has remained well for four years.

I. Kaplin⁸ describes a method of combined X-ray and radium therapy. He uses small doses spread over a long period, rather than large doses over a short period. He has reverted to the use of radium applicators in preference to introducing the radium into or around the tumour by means of seeds or needles. The doses used vary from 2500 to 8000 mgrm.-hours. He reports improvement in several cases, but no case that can be considered a cure.

R. Gouverneur⁹ gives as his opinion that operable cancer of the rectum should never be treated by radium. He objects very strongly to the use of radiation from the abdomen, and quotes 21 cases, 10 of which died within eighteen months to two years, all of which were good operable risks. The great objection to local radiation of inoperable tumours is the serious inflammation that often results and the grave pain which it frequently causes to the patient. He believes that complete removal of the rectum by operation is the best method in operable cases.

Robert Monod¹⁰ quotes the figures from the Lacassagne Clinique. There were 49 cases treated with radium during ten years (1919-29) and no absolute cure.

B. Displas¹¹ states that in all the cases of cancer of the rectum that he has seen treated by radium or deep X-ray therapy, it very seldom led to any amelioration of the symptoms, but practically always provoked severe reactions which were damaging to the patient. He concludes that all cases that can be treated by operable removal should be so treated, and that the inoperable cases should be treated by a colostomy. He believes that the addition of radium treatment only aggravates the discomfort of the patient, and considers that cancer of the rectum is particularly unsuitable for treatment with radium.

Alglave¹² believes in the treatment of cancer of the rectum by performing a preliminary colostomy followed by the application of radium to the tumour by means of applicators placed in the rectum. He uses a large dose over three to four days. He describes 4 cases which he has treated in this way, 2 of which were apparently well four and six years after the treatment.

Two interesting papers appear from Australia. One, by L. M. McKillop,¹³ describes the relative advantages of different forms of treatment of cancer of the rectum. He believes that a permanent colostomy is necessary in all cases, followed either by resection of the rectum through a posterior approach, or the use of screened radium needles. He thinks that the ideal treatment is by abdominal excision, but it is only applicable in comparatively few cases. The other paper is by B. Kilvington.¹⁴ He points out the necessity for much earlier diagnosis, and gives radium the first place in the treatment of rectal cancer. He does not believe a colostomy is necessary.

REFERENCES.—¹*Presse méd.* 1932, March 19, 433; ²*Surg. Gynecol. and Obst.* 1931, Nov., 670; ³*New Eng. Jour. Med.* 1931, June 18, 1279; ⁴*Amer. Jour. Surg.* 1931, Oct., 161; ⁵*Zentralb. f. Chir.* 1931, July 11, 1746; ⁶*Deut. Zeits. f. Chir.* 1931, Oct., 522; ⁷*Surg. Gynecol. and Obst.* 1932, Feb., 307; ⁸*Jour. Amer. Med. Assoc.* 1931, Oct. 3, 991; ⁹*Bull. et Mém. Soc. nat. de Chir.* 1932, March 12, 404; ¹⁰*Ibid.* March 5, 353; ¹¹*Ibid.* March 12, 408; ¹²*Ibid.* Feb. 20, 293; ¹³*Med. Jour. of Australia*, 1931, Sept. 12, 317; ¹⁴*Ibid.* 320.

RECTUM, PROLAPSE OF.

John Fraser, Ch.M., F.R.C.S.Ed.

D. Galbraith¹ recounts a simple method which he has found satisfactory for the treatment of this troublesome complaint. He says, "It is devoid of risk, success can be guaranteed, and the child is able to run about as usual within a few hours of operation." The method consists in the injection of 1.5 c.c. of Alcohol into the perirectal tissues on each side of the bowel. A long needle of moderate calibre is inserted $\frac{1}{4}$ in. lateral to the muco-cutaneous edge at the 3 o'clock and 9 o'clock positions to a depth of $2\frac{1}{4}$ in., a finger in the rectum acting as guide to the needle, which lies as near to the finger as possible without perforating the bowel. For a week after the operation the buttocks are strapped together, but the child may be allowed to go about. For a period of six weeks the bowel is evacuated while the child lies on its side. The results appear to be uniformly good, and no sloughing or other ill effect has been observed.

REFERENCE.—¹*Med. Jour. Australia*, 1931, Nov. 14, 620.

RECTUM, STRICTURE OF.

J. P. Lockhart-Mummery, F.R.C.S.

J. Sénèque¹ discusses the causes of non-malignant stricture of the rectum and their relationship with Nicholas-Favre disease. He describes two distinct types: (1) Simple stricture limited to the rectum; (2) Strictures with elephantoid lesions spreading into the surrounding tissues. The latter are often complicated by abscess and fistulæ in the peri-anal region, and are sometimes thought to be due to tubercle, although tubercle bacilli cannot be found. It seems certain that they are of lymphogranulomatous origin. In

one group of cases the inflammatory mass extends all over the pelvis. The author considers that attempts should be made to transmit the disease to monkeys by inoculating them with extracts from the tissues.

Professor B. K. Finkelstein¹ quotes 50 cases of simple stricture of the rectum extending over a period of twenty-four years. They were nearly all the result of trauma due to previous operation, or infection, mostly of gonorrhœal origin. They were seldom due to syphilis, tubercle, dysentery, or parasites. In a few cases, due to dysentery, large pseudo-tumours were present in the wall of the rectum causing considerable narrowing of the lumen. In the majority of cases the most serious degree of stricture was in the lower end of the rectum. He advises **Resection** of the damaged portion of the rectum as the most satisfactory treatment when it can be carried out, or, failing this, a **Colostomy**.

V. O. David and C. A. Lauer² have seen 150 patients with simple stricture of the rectum during the last ten years. There was a positive Wassermann reaction in 50 per cent of them, but in no case did they notice any improvement as the result of vigorous anti-syphilitic treatment, and it is their opinion that syphilis is not an etiological factor. Four of the cases were definitely proved to be due to gonorrhœal infection, and three cases were due to hyperplastic tubercle.

H. T. Hayes⁴ analyses 113 cases of stricture of the rectum in a mixed population of whites and blacks. Wassermann tests showed 68 to 93 per cent positives. He found that antisyphilitic treatment did not stop the development of the stricture or improve the condition in any way. He concludes that nearly all strictures of the rectum are inflammatory, that gonorrhœa is the chief etiological factor in coloured races, and that syphilis plays a very unimportant part in the causation.

These findings correspond very closely to what has been found in this country. It used to be thought that most cases of simple fibrous stricture of the rectum were the result of syphilis, but it is now generally agreed that syphilis is only accountable for a very small, almost negligible, proportion of the cases. No particular organism has been discovered as a causal factor, though it is generally agreed that gonorrhœa is often a primary factor. The exact etiology of this condition is still a puzzle. While many forms of treatment have been suggested, the only one which is really satisfactory, when it can be carried out, is a total or partial resection of the affected bowel.

REFERENCES.—¹*Presse méd.* 1932, Jan. 6, 22; ²*Arch. f. klin. Chir.* 1932, Jan., 547; ³*Jour. Amer. Med. Assoc.* 1932, Jan. 2, 1; ⁴*Amer. Jour. Surg.* 1932, May, 323.

RENAL DISEASE. (See also KIDNEY; PYELITIS AND COLI BACILLURIA.) S. W. Patterson, M.D., D.Sc., M.R.C.P.

Albuminuria.—Geoffrey Evans¹ (London) makes the following classification of albuminuria:—

Accidental albuminuria.

True albuminuria.--

1. Extra-renal albuminuria, including diseases of the urethra, prostate, bladder, ureter, and renal pelvis.
2. Renal albuminuria.—
 - a. Organic albuminuria, including: (i) Toxæmic kidney; (ii) Bright's disease; (iii) Residual albuminuria; (iv) Vascular disease, including arteriosclerotic kidney (hyperpiesia), senile kidney (senile arteriosclerosis), thrombosis, and embolism; (v) Surgical diseases of the kidney.
 - b. Functional albuminuria, including: (i) New-born infants; (ii) Adolescents; (iii) Lordotic, orthostatic, cyclic, and intermittent; (iv) Circulatory disturbance; (v) Fatigue, cold, and over-eating.

from 0 to 425,000. The white blood-cells and epithelial cells had an average of 322,550 per twelve hours, and ranged from 32,400 to about 1,000,000. Protein was present in amounts which probably varied between 10 and 80 mgrm. per twelve hours. The diagnosis of Bright's disease therefore becomes a quantitative one. Those individuals have Bright's disease who have more protein and a greater number of casts than are to be found in the urine during health: taking values which lie outside the range of normal variation, a rate of protein excretion of more than 30 mgrm. per twelve hours, and a rate of cast excretion in excess of 5000 casts per twelve hours. W. Goldring¹¹ (New York) has followed up the clinical application of the urine sediment count test as devised by Addis, and concludes from his observations on healthy and diseased people that healthy individuals in a twelve-hour period may excrete up to 500,000 red blood-cells, 1,000,000 white and epithelial cells, and 5000 casts. Hematuria (over half a million red blood-cells in the twelve-hour sediment) is unusual as a result of renal passive congestion alone, and subacute bacterial endocarditis is the only form of heart disease in which striking hematuria may occur. In all other cases it connotes disease of the urinary tract.

The dilution and concentration test (*see* MEDICAL ANNUAL, 1932, p. 437) sponsored by Vollhard finds much acceptance in Germany. A patient whose kidneys are functioning normally has a wide range of urinary concentration; with large amounts of fluid the specific gravity of the urine may fall to 1003 on an ordinary diet, but with not more than half a litre of fluid the specific gravity should rise to at least 1025. P. Vallery-Radot and A. Lafitte¹² (Paris) advocate the use of this test, combined with, but not in place of, the estimation of blood-urea, the calculation of Ambard constant, and the test by elimination of phenolsulphonephthalein. They have found it applicable to clinical cases.

Bright's disease.—

CLASSIFICATION.—The differentiation of various types of renal lesion in bilateral blood-borne kidney disease has exercised the minds of clinicians and pathologists since Bright's original description of the complaint. Diagnosis is essential before rational treatment can be adopted, and numerous classifications have been offered which attempt to divide up cases of nephritis into groups. T. Addis and J. Oliver¹³ (San Francisco) point out, however, that any classification of Bright's disease must remain arbitrary and meaningless until it is shown to have both a clinical and a pathological significance—clinical, in that it is found to be of assistance in diagnosis and in the study of etiology and prognosis; pathological, in the sense that the groups into which it separates patients correspond to histological differences in the structure of their kidneys. In conjunction with a pathologist Addis studied a consecutive series of patients with proteinuria and cylindruria who had been classified during life in accordance with measurements of the rates of excretion of protein and formed elements (*see above*, Addis' sediment test). The kidneys were carefully examined macro- and microscopically. One of the general results was the recognition of the fact that the material was not susceptible of classification on the basis of absolute pathological distinctions. It was *not* found that in some instances the lesions were inflammatory, in others degenerative, and in still others atrophic; on the contrary, in every case all three types of lesion were demonstrable. It was *not* found that in some cases the glomeruli were affected, in others the tubules, and in still others the vascular and interstitial tissues; on the contrary, in every case all these tissues were involved. In accordance with this view, then, even the clearest pathological differentiations in regard to the kidney in Bright's disease are of a quantitative, not of a qualitative, nature. This accords with the view of clinicians who are called on to see and treat patients after

the beginning of acute toxic (glomerular) nephritis—a condition which is hardly ever seen post mortem. Nevertheless, if certain type lesions in the kidney are defined and called glomerulitis, parenchymal degeneration, interstitial proliferation, and arteriosclerosis or endarteritis, it is possible to differentiate certain groupings which correspond with clinical conditions.

Table I, quoted from Addis and Oliver, shows the groups.

Table I.

CLINICAL GROUP	GLOMERULITIS	PARENCHYMAL DEGENERATION	INTERSTITIAL PROLIFERATION	ARTERIOSCLEROSIS OR ENDARTERITIS
Hæmorrhagic (toxic)	+	±	±	±
Degenerative (nephrosis)	—	+	±	±
Arteriosclerotic	—	±	+	+

INCIDENCE.—A. Osman¹⁴ (London) believes that nephritis is one of the chief causes of death in this country, and that it is still increasing. L. D. S. de Wesselow¹⁵ (London), on examining 50,000 infantrymen just landed in France after completing three months' training at home without breaking down, found that 5 per cent had albuminuria, 2 per cent in high degree, while epithelial casts were present in 0.84 per cent. It may be concluded that 1 per cent of presumably healthy men were suffering from a grade of albuminuria which led to the passage of epithelial casts.

CAUSATION.—Of the forms of Bright's disease, the most striking in its incidence—as an acute complication of various streptococcal infections—and characteristic in its clinical appearance and evolution is the hæmorrhagic form, acute toxic (glomerular) nephritis. T. Addis¹⁶ (San Francisco) found in his series of cases that the illness preceding the onset was tonsillitis in 33 per cent, infected wounds in 20 per cent, scarlet fever in 16 per cent, fever (cause unknown) in 16 per cent, upper respiratory infections in 11 per cent, and middle-ear infections in 4 per cent. W. Willcox¹⁷ (London) confirmed the importance of infections of the respiratory tract. In a large proportion of cases the tonsils seemed to be the starting-point, but even if the tonsils were removed other septic foci were likely to be still active and to perpetuate the nephritis. A. C. Alport¹⁸ (London), impressed by the finding of D. Paterson and W. G. Wyllie that 85 per cent of cases of acute hæmorrhagic nephritis in children are due to tonsillitis or associated conditions such as cervical adenitis and otitis media, shows that in the vast majority of cases of nephritis of various types it is possible to demonstrate infection of the tonsils, antra, or teeth; and that early removal of focal sepsis appears to give the best results.

C. Catteruccia¹⁹ (Rome) found nephritis in 4 per cent of 535 children affected with impetigo and other pyodermal infections. A. C. Ernstene and G. P. Robb²⁰ (Boston) report an interesting familial epidemic of acute diffuse glomerulonephritis not due to scarlatina: 8 of 10 children successively developed an acute infection of the upper respiratory tract (probably streptococcal), and in 6 symptoms and signs of acute Bright's disease appeared during convalescence.

The degenerative form of Bright's disease (nephrosis) may be: (1) Larval, following febrile states, diabetes, or pernicious anæmia; (2) Necrotizing, after salvarsan, mercury, strong acids; (3) Chronic, of doubtful etiology or associated with tubercle or syphilis or chronic focal infections; (4) Amyloid, in the presence of chronic suppuration. L. Bernard and J. Paraf²¹ (Paris) quote

cases which were probably due to tubercle; they responded well to a full **Meat Diet** and extract of **Thyroid Gland**.

Chronic interstitial nephritis follows infections (bacterial, syphilis), indulgence in alcohol, gout, osteo-arthritis, and diabetes (W. G. Ball and G. Evans²²). A. R. Rich²³ (Baltimore) describes a peculiar and specific form of nephritis associated with acquired syphilis, characterized by focal accumulations of mononuclear cells situated in the interstitial tissue, especially in the cortex, and perivascular mononuclear accumulations. The extent of the process varies greatly in different cases. It is always a focal lesion, but may be widespread throughout both kidneys. Crystals of cholesterol are deposited in the foci, but so far spirochætes have not been demonstrated.

PROGNOSIS.—H. Gainborough²⁴ (London) holds that toxic nephritis is a progressive disease, of the most variable severity. 'Nephrosis' comprises a clinical and metabolic syndrome which is superimposed upon all cases of toxic nephritis. The most nephrotic cases are those in which the nephritis presents the mildest histological changes and the slowest rate of progression. All cases of toxic nephritis present a progressive loss of renal function and tend to terminate in uræmia. In the most nephrotic cases this change is so slow that such cases die, usually from intercurrent infection, or recover, before loss of renal function as usually measured is recognizable. In de Wesselow's¹⁵ (London) experience the vast majority of cases of acute glomerular nephritis cleared up, the urine being free of albumin a year later; 6000 men who had had trench nephritis showed no trace of nephritis when examined for pension. Of the cases in which albumin and casts persisted and became chronic, a few ran a stormy course, with œdema, hypertension, and renal inadequacy, and might die in a few months. Most of them became latent; this condition of chronic nephritis may shorten life, but Addis quotes a case in which the terminal uræmia did not supervene until 55 years after the original nephritis.

PATHOGENESIS.—E. Coelho and J. Rocheta²⁵ (Lisbon) point out that pure chronic nephrosis (lipoidal nephrosis) is a rare condition, though it may be simulated by the intermediate stage of ordinary glomerulonephritis on account of the œdema and albuminuria. In true nephrosis there is increased cholesterol in the blood, diminution of total blood proteins, and an inversion of the usual relations of serum albumin to globulin. *Table II* shows the relationship in

Table II.

BLOOD CONTENT			NORMAL	NEPHROSIS
			Per 100 c.c.	Per 100 c.c.
Total proteins	..	..	7-9	4-5
Serum albumin	..	..	4-5	0.5-1
Serum globulin	..	..	2-3	3.5
Cholesterol	..	..	140-180	1000
Leeithin	..	..	190-250	730
Fatty acids	..	..	360-550	500

normal and nephrotic cases. Coelho and Rocheta investigated two cases of nephrosis clinically, and tried to produce the disease by thyroidectomy in animals. Their observations on these subjects and on cases of clinical hyper- and hypothyroidism lead them to conclude that pure nephrosis is a malady primarily metabolic and only secondarily renal, but in its pathogenesis it has no relationship with the state of the thyroid gland. Œdema is a striking feature of nephrosis and is related to the lower osmotic pressure of the capillary blood owing to diminished total proteins and especially lessened serum albumin.

The factors in the production of œdema are the filtration pressure due to the intravascular pressure in the capillary, the osmotic pressure of the blood counteracting the filtration pressure, the permeability of the vessel wall, the salt content of the tissues which hold the water that has exuded through the capillary wall, stasis of lymphatic drainage, and a certain amount of nervous control.

H. A. Christian²⁶ (Boston) subdivides œdema into seven clinical varieties, cardiac, hepatic, renal, nutritional, anæmic, inflammatory, and anaphylactic. Of these varieties of œdema, cardiac and hepatic œdema have a very similar mechanism; in the same way renal, nutritional, and anæmic œdemas are closely related, as are inflammatory and anaphylactic œdemas. Further, in the œdema of acute nephritis probably the chief causative factor is an increased permeability of the vessel wall from some unknown toxic cause. In the renal œdema of subacute and chronic nephritis a lowered osmotic pressure seems the chief causative factor, with variations in the electrolyte content of tissue fluids in addition. Patients with chronic nephritis without renal œdema frequently in the course of their illness develop cardiac insufficiency and have cardiac œdema in which changes in intravascular filtration pressure play the significant part in the mechanism.

I. Mufson²⁷ (New York) studied the capillary pressure in cases of nephritis and hypertension. From a consideration of the morphology and blood-pressure of the capillaries in cases of essential hypertension he concludes that in essential hypertension there is a generalized constriction of the vascular tree, and not just an arteriolar spasm such as occurs in peripheral arteriolar spastic (Raynaud's) disease. All the cases of acute nephritis had a high capillary pressure with blood and albumin in the urine, all disappearing in convalescence. A large majority of the cases of chronic nephritis with a high capillary pressure had albumin and blood in the urine. Those with gross hæmaturia were limited to the increased pressure group. This association of increased capillary pressure and urinary signs during the active stage of the disease is indicative of a systemic capillary involvement. This increased capillary pressure together with injury to the capillary endothelium suffices to explain cases, often seen, in which œdema is present with a normal serum osmotic pressure.

P. M. T. Kerridge and L. E. Bayliss²⁸ (London) point out that, although urine from a normal kidney does not normally contain more than a trace of protein, proteinuria may be due to physiological conditions such as those occurring with venous stasis as well as the pathological states of nephritis, nephrosis, and the various toxæmias of pregnancy, fevers, etc. In many of these cases it has been demonstrated that the protein in the urine is identical with the albumin and globulin of the plasma, and it has been assumed that the kidneys allowed these to leak through, either because of local damage, or because of the poor conditions under which they were made to function. In recent years it has been suggested that it may be in some cases the proteins which are at fault, instead of the kidneys. The authors find from experiments on animals that only proteins with lower molecular weights than 68,000 are excreted. These are gelatin, egg albumin, Bence-Jones protein, and hæmoglobin. Other proteins of higher molecular weight are not excreted normally. It would seem, therefore, that an increased permeability of the capillary wall must occur through anoxæmia or other toxæmia.

TREATMENT.—W. R. Campbell²⁹ (Toronto) discusses the treatment of renal disease, using as a classification of the varieties a modification of the one proposed by Volhard and Fahr in 1914.

Simple acute nephrosis is an uncommon disease, and no specific treatment is known. Many patients recover completely with most diverse treatment;

often, however, they die of an intercurrent infection. An extremely **High Protein Diet**, introduced by Epstein, has produced good results. **Urea** in large doses is sometimes useful as a diuretic. Induction of acidosis by **Calcium Chloride** or **Ammonium Salts**, or the use of **Purin** and **Mercury Diuretics** (salyrgan) is sometimes successful in reducing the oedema. **Parathormone** has also been recommended. **Whole Blood Transfusion** has been said to be valuable. Campbell is opposed to prolonged under-nutrition in these cases, but rest in bed and drastic restriction of mineral salts and water is essential; and free purgation is useful in reducing massive oedema. While the possibility of focal infection should be thoroughly investigated, the danger of surgical intervention in oedematous patients should be kept in mind, and operation only undertaken under favourable conditions. Tapping serous cavities and Southey's tubes should be avoided. **Dried Thyroid Gland** sometimes induces a diuresis; the amount required is large, and as much as 15 gr. daily may be given without raising the basal metabolism.

Acute nephritis usually follows an upper respiratory infection. The removal of foci of infection at a suitably selected time is very important for the patient's subsequent welfare. The greater number of cases of acute nephritis should recover clinically if treated early and persistently. **Rest in Bed** is essential; and at the outset, in early cases with high blood-pressure, oedema, and oliguria with haematuria, **Complete Starvation** of food and fluid may be insisted on for two or more days; in less severe cases cold sweetened **Fruit Juices** may be allowed. **Purgation** is also employed, with **Hot Packs** to induce sweating, and **Diathermy** may possibly be of value. In all cases food and fluids should be kept within the limits of the renal efficiency. For accuracy of control and ease of administration small quantities of milk are best to start with; foods high in carbohydrate and fats may be added to the diet as improvement takes place, together with vitamin C in the form of tomato- or orange-juice. As the sodium salts tend to produce oedema and seem particularly difficult to excrete in this stage, it is advisable to restrict salt. One should endeavour to increase the work of the kidney only as rapidly as the recovering renal tissue shows an ability to handle it without recurrence of blood or albumin or rise in blood-pressure. When an adequate caloric intake is successfully borne, the patient may be allowed up. At this stage the protein intake must be increased to make up for the greater loss and increased metabolic strain.

The part played by the inorganic metabolism and the influence of acids and alkalis in the functioning of the kidneys have been elucidated by several workers, and deductions drawn which may be applied in treatment. A. P. Briggs³⁰ (St. Louis) found in various types of chronic nephritis a disturbance of the acid-base equilibrium. Prolonged administration of mineral acid to nephritic patients without oedema leads to waste of more base than in normal controls. The defect in conservation of base, as well as of water, chlorides, and other substances, depends largely on an increased rate of flow of the glomerular fluid through the surviving tubules. The chief function served by ammonia formation is the prevention of excess acidity in the genito-urinary tract.

The **Alkaline Treatment** of chronic nephritis is advocated by D. M. Lyon, D. M. Dunlop, and C. P. Stewart³¹ (Edinburgh), who point out that the classical treatment of chronic interstitial or azotemic nephritis consisted in giving an exceedingly **Low Protein Diet**, chiefly in the form of milk, with the total exclusion of meats. This diet, though accidentally basic in character, was deficient in nitrogen; and the modern procedure, recognizing this deficiency in protein intake, allows a more generous amount of protein, but in doing so fails to provide the excess of basic radicals over acidic radicals needed to balance

the loss of base. The authors recommend that the urine of chronic nephritics should be kept alkaline, and that this can best be accomplished by giving basic ash foods together with an adequate quantity of alkaline salts. The type of protein (meat or vegetable) is theoretically immaterial, provided always that it is adequate and that sufficient alkali is given. In practice, however, the highly acidic character of meat and cereals makes their adequate covering with alkali a matter of difficulty, and it seems desirable that for this reason their inclusion in the diet should be restricted, though not necessarily abolished. The proteins should therefore be derived mainly from milk and vegetables, though it is possible to include enough meat, fish, and eggs to secure reasonable variety. In cases of nephritis with œdema, however, F. H. Lashmet²² (Ann Arbor, Mich.) finds that the reaction of the total ash intake is more important in influencing œdema than the total amount of ash; alkaline ash intake increases the œdema and acid ash intake decreases it. Œdema is not due to the failure of the kidneys to excrete chlorides; since chloride as sodium chloride increases œdema, but as hydrochloric acid or ammonium chloride diminishes it, apparently the reaction of the compound is more important than the chloride content as such. Lashmet has treated cases of nephritic œdema for the past two years with satisfactory results by using a low protein, 'salt-poor' diet with a neutral ash, to which are added acids or acid-producing salts, the fluid intake being forced rather than restricted. **Ammonium Chloride** as adjuvant to the **Mercury Diuretics** in the treatment of renal œdema probably derives its use in the same way.

It seems best to regard all nephritis as being various stages of an inflammatory process, though the phases or stages of the disease are sometimes difficult to separate. After the acute stage is over, cases may be divided into two groups: (1) Those with a sufficiency of renal tissue though with kidney reserve somewhat reduced; (2) The stage of renal insufficiency. The former stage, which comprises most of the ambulant nephritics, may last for years; the factors which tend to shorten the patient's life being exacerbations and overwork of the kidney. In this stage the functional kidney tests are the best methods of controlling treatment. Salt and water are allowed in suitable quantities and the protein intake may be restricted to 50 to 70 grm. A daily saline is desirable. The patient should be kept warm at all times, and prompt attention to colds, minor infections, teeth, and sinus affections will do much to ward off exacerbations. During an exacerbation the patient is treated as an acute nephritic. Convulsions are chiefly confined to acute nephritis and acute exacerbations of chronic nephritis. They are due to defective water balance in the brain and have nothing to do with true uræmia (Campbell). The first thing is to prevent the patient's injuring himself by biting his tongue, then stop the convulsion by **Chloroform** until **Morphine** ($\frac{1}{2}$ to $\frac{1}{4}$ gr.) has time to act. To remove the fluid from the brain, intravenous injections of 50 per cent **Glucose Solution** are used. Free purgation is induced with **Croton Oil** or liberal amounts of **Magnesium Sulphate**.

In the stage of renal insufficiency larger quantities of urine are excreted to keep the waste products of metabolism from accumulating in the blood-stream. Liberal fluid administration is necessary, and at the same time nitrogenous waste must be reduced to a level within the capacity of the kidney to excrete. The caloric intake is, therefore, supplied largely by carbohydrate and fat; protein is restricted and the patient is kept at rest. While the water and concentration tests will tell when the kidney reserve is exhausted, in this stage it is necessary to depend more on blood-retention tests (non-protein nitrogen, urea, and creatinine) to determine the amount of protein allowable, and the prognosis. True uræmia results when sufficient impairment of kidney function

has taken place to cause an inability to excrete all the metabolic waste of the body. It may come on very slowly or follow an acute exacerbation of the disease. The protein breakdown should be kept at a minimum by rest and by feeding an adequate carbohydrate diet with liberal fluids and a minimum of protein. If necessary 8000 to 4000 c.c. of fluid containing glucose may be given intravenously daily by slow drip. Purgation is useful; the alkaline salts may be used to relieve the dyspnoea; intravenously administered glucose (without salt) may relieve dehydration; and the milder sedatives, the irritability.

S. Dejust-Defiol and M. Romme³⁵ (Paris) have revived the question of administering **Renal Extract** in nephritis. This method was introduced by Dicuiafoy in 1892, who used glycerinated extract of kidney (**Nephrine**). Dubois later proposed to use an aqueous extract of macerated kidney by the mouth. The authors use an extract deprived of proteins and lipoids (**Inorénol**). They found the diuresis augmented in two-thirds of the cases treated. The diuresis attains a maximum on the third day, the best results being in cardiorenal cases, with least effect in nephrosclerosis. The blood-urea was lowered in two-thirds of the cases, the albumin was diminished, and in some cases the blood-pressure lessened.

The **Waters** of certain spas have been recommended for chronic nephritis. K. Lauer³⁴ (Frankfurt a-M.) has investigated the effects of the waters from the Bad Wildung natural springs. They cause a considerable diuresis in normal persons and in patients with kidney lesions, including hydronephrosis. The good effect is absent in those cases of renal and vascular disease where there is a tendency to œdema and rise of blood-pressure.

W. Denk³⁶ (Vienna) discusses the surgical treatment of nephritis. The two methods in general use are **Decapsulation** and **Nephrotomy**. The author has collected the published results and urges that these methods of treatment should be considered in chronic cases.

REFERENCES.—¹*Practitioner*, 1932, July, 152; ²*Med. Jour. and Record*, 1931, Dec., 523; ³*Arch. of Internal Med.*, 1932, Jan., 45; ⁴*Polichinco*, 1931, July, 371; ⁵*Ibid.* 1932, June, 265; ⁶*Arch. of Internal Med.*, 1931, Oct., 598; ⁷*Quart. Jour. Med.*, 1931, July, 567; ⁸*Lancet*, 1932, i, 83; ⁹*Irish Jour. of Med. Sci.*, 1932, March, 119; ¹⁰*Jour. Amer. Med. Assoc.*, 1925, July 18, 163; ¹¹*Amer. Jour. Med. Sci.*, 1931, July, 105; ¹²*Presse méd.*, 1931, Oct., 1557; ¹³*Renal Lesion in Bright's Disease*, 1931, New York, Hoeber; ¹⁴*Lancet*, 1932 i, 620; ¹⁵*Ibid.*; ¹⁶*Johns Hopkins Hosp. Bull.*, 1931, Nov., 282; ¹⁷*Lancet*, 1932, i, 621; ¹⁸*Ibid.*, 1247; ¹⁹*Polichinco*, 1931, Nov., 1653; ²⁰*Jour. Amer. Med. Assoc.*, 1931, Nov., 1382; ²¹*Presse méd.*, 1931, Oct., 1589; ²²*Diseases of the Kidney*, 1932, London, Churchill; ²³*Johns Hopkins Hosp. Bull.*, 1932, June, 357; ²⁴*Lancet*, 1932, i, 1131; ²⁵*Presse méd.*, 1931, Dec., 1875; ²⁶*Jour. Amer. Med. Assoc.*, 1931, Aug., 297; ²⁷*Amer. Jour. Med. Sci.*, 1932, May, 632; ²⁸*Lancet*, 1932, ii, 785; ²⁹*Canad. Med. Assoc. Jour.*, 1931, Nov., 571; ³⁰*Arch. of Internal Med.*, 1932, Jan., 56; ³¹*Lancet*, 1931, ii, 1009; ³²*Jour. Amer. Med. Assoc.*, 1931, Sept., 918; ³³*Presse méd.*, 1932, Feb., 238; ³⁴*Munch. med. Woch.*, 1931, Nov., 1943; ³⁵*Wien. klin. Woch.*, 1931, Nov., 1425.

RENAL EFFICIENCY TESTS. (See RENAL DISEASE.)

RESUSCITATION FROM ASPHYXIA.

G. E. Oates, M.D., M.R.C.P., D.P.H.

Sir Robert H. Davis,¹ in a letter to *The Times*, pleads for the greater use of an effective dosage with **Oxygen and Carbon Dioxide** in gas poisoning, drowning, electric shock, and other accidents. In such cases, whether or not artificial respiration is used, a mask should be applied to the face of the patient and the mixture turned on.

Y. Henderson² urges the importance of the inhalation of carbon dioxide in resuscitation from all kinds of asphyxia and the prevention of secondary pneumonia. In cases of drowning, carbon monoxide poisoning, and other accidents,

as well as after surgical anaesthesia, the prevention of secondary pneumonia is almost as important as the immediate resuscitation. Inhalation of carbon dioxide mixed with oxygen or with air is the most effective means of stimulating respiration. The proportion of carbon dioxide should be at least 7 per cent, and may be 10 per cent or more. This inhalation has proved to be also a highly effective preventive—indeed, it is essentially the specific preventive—of the collapse of the lungs which leads to pneumonia. In asphyxia of the newborn it is replacing the old and often ineffective methods of swinging, spanking, and dipping in cold water. The author also states that the large number of neonatal deaths which are due to pneumonia developing in undilated areas of the lung may be lessened if the lungs of every newborn child are fully dilated by the inhalation of carbon dioxide in the first few days of life. Finally, the inhalation of carbon dioxide after anaesthesia and operation, and in other conditions of lowered vitality, by restoring respiration and muscle tonus, counteracts both the depression of the circulation and the tendency to atelectasis and pneumonia. (See also LUNG, POST-OPERATIVE MASSIVE COLLAPSE OF; PHARMACOLOGY—OXYGEN AND CARBON-DIOXIDE THERAPY; PNEUMONIA.)

On the Australian beaches during the summer months bathing accidents are common and the resuscitation of the apparently drowned has become developed to great perfection. A committee of medical men³ have advised several improvements in technique. The present teaching is that while resuscitation is proceeding the patient lies on the cold sand in a wet bathing costume until it is finished, when 'restoration of the circulation' is carried out by means of vigorous rubbing towards the heart, accompanied by firm slapping of the palms of the hands and the soles of the feet. It is recommended that this rubbing and slapping be entirely discontinued, and that, where assistance is available, the treatment of shock should be begun immediately the patient is brought ashore and whilst resuscitation is proceeding. The measures recommended include drying the patient, wrapping him in a blanket, and the application of warmth.

The method of resuscitation advocated is the Schäfer method with a slight modification. Usually the operator works from the left side of the patient or astride his body; it is now proposed that he should straddle the patient's left knee between his knees. This gives the greatest ease to the operator, especially to his wrists, which are likely to become very tired.

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RETINA, DETACHMENT OF.

W. S. Duke-Elder, M.D., F.R.C.S.

In the two previous issues of the MEDICAL ANNUAL (1931, p. 411; 1932, p. 444) the subject of detachment of the retina has been treated at length. When an entirely new method of treating a disease of first-class importance is introduced—more especially, as in the present case, when a method which promises good results is applied to a condition which before was virtually untreatable—it must of necessity excite an unusual amount of interest. This must be an excuse for dealing with the subject again at considerable length; for during the past year not only has much work been done upon the pathological aspects of the subject, but many modifications of the original method of treatment have been introduced, some of which, in certain cases, are beginning to replace the original operation of ignipuncture suggested by Professor Gonin, of Lausanne. Of these, two are of outstanding importance: the operation of multiple trephining introduced by Professor Guist, of Vienna, and treatment by diathermy as practised by Professor Weve, of Utrecht, and Sven Larsson, of Stockholm. This section will therefore be divided into three sections: a consideration of the results now obtained with the original

technique of Gonin, and a description of the two newer operations which in many cases may well replace it.

Gonin's Operation of Ignipuncture (for details of technique, see *MEDICAL ANNUAL*, 1931, p. 411; 1932, p. 446).—The very considerable number of cases which have now been operated upon allows a fairly good estimate to be made of the operative prognosis. This is illustrated in the following statistics taken from published papers :—

OBSERVER	NUMBER OPERATED ON	NUMBER RECOVERED	NUMBER SHOWING IMPROVEMENT	RECOVERIES PER CENT
Gonin (1929)	81	43	—	53
Arruga (1929)	33	?	?	?
Bruckner (1929)	12	5	—	42
Vogt (1930)	26	11	—	42
Møller (1930)	50	—	—	12
Lindner (1930)	33	13	—	39
Amstler (1931)	29	12	—	41
Igersheimer (1931)	21	5	—	24
Bielschowsky (1931)	18	2	—	11
Fleischer (1931)	12	1	—	8
Clausen (1931)	30	—	—	25
Stein (1931)	41	10	—	24
Wessely (1931)	18	3	4	17
Shapland (1931) [Moorfields] ..	100	40	17	40
Doggart and Shapland (1931) [Moorfields]	75	24	12	32
Gonin (1931)	221	118	—	53

Of these, the most interesting from our point of view are those of Gonin himself, and of Shapland and Doggart and Shapland, who reported the collective results of the staff of Moorfields Hospital. Gonin's conclusions are as follows: In more than 50 of the total number of cases one thermopuncture directly on the tear suffices to cause obliteration and permits cure in about fifteen days. In patients operated on in the first three weeks, the proportion of successes is found to be doubled. In 53 of his, he was obliged to repeat the thermopuncture because the first application was incomplete or was followed by a relapse. In detachments of less than one year, cures may be obtained in the neighbourhood of 40 per cent, while cases dating over three months show in his experience about 48 per cent, and this can be brought to 55 per cent if the operative intervention is made at least three weeks after the appearance of the detachment. All relapses indicate an insufficient obliteration of the initial tear, or the presence of another not reached by the cautery. A relapse due to the production of a new tear independent of that which caused the first detachment may be met with after a few months or years, and even though it is a troublesome complication, the possibility of renewing treatment with subsequent cure is not excluded. In the Moorfields series the important points are that the prognosis is better in younger patients, and in recent detachments: the longest duration in which a successful result was obtained was twelve months. The prognosis is also better in emmetropes than in myopes, the percentage of cures being 46·3 in the former and 37·5 in the latter. No case (out of the three operated upon) of aphakia was successful. With regard to the type of hole in the retina, a small round hole would appear to give the best prognosis, a successful result having been obtained in 53 per cent of the cases in which it occurred; a marginal disinsertion comes next,

giving a successful result in 49 per cent of cases; and an arrowhead-shaped rent shows the relatively poor operative figure of 26 per cent successes.

Multiple Trephining.—The operation of multiple trephining aims at producing a less drastic reaction over a wider area with a view to making the retina adhere to the underlying tissues over a considerable region round the hole. The eye is anæsthetized with cocaine and a large conjunctival flap dissected down to the sclera over the region of the tear in the retina: if the detachment is extensive, or if many retinal holes are present, the sclera may be exposed over a large part, or even the whole of its circumference, any muscles in the way being reflected back if necessary. When all adventitious tissue has been removed a trephine hole is made (1.5 mm.) penetrating through the sclera only and leaving the choroid intact: it is of extreme importance that the choroid should not be wounded, for in this event the globe becomes perforated and the eye collapses. In this lies the essential feature of the operation—to limit the trephine disc to scleral tissue only. This is not altogether easy to do, for near the equatorial region of the eye the sclera is only $\frac{1}{2}$ mm. thick, and the utmost caution must therefore be exercised. A number of such holes are made surrounding the first, all over the area of the greatest detachment, especially in the region of the hole, and in very extensive detachments with multiple retinal tears a very large number of trephine holes may be necessary round a large part of the circumference of the globe. Thereafter a paraffin-mounted **Caustic Potash Stick** with the point freshly sharpened is introduced into each trephine hole for one or two seconds so as to cauterize the choroid, and immediately after each application, the violent caustic reaction which is produced is arrested by applying a drop of 0.5 per cent **Acetic Acid** to the hole. When all the trephine holes have been treated in this way, one near the position of the hole is chosen and a probe thrust through it to allow the subretinal fluid to escape and the retina to fall upon the cauterized choroid. If a muscle has been detached, it is now stitched in place, and the conjunctival flap stitched in position.

Diathermy.—In Larsson's diathermy technique the conjunctiva is detached at the corneoscleral boundary and stripped off over an area corresponding to the extent of the retinal detachment. The globe is carefully exposed. In order to gain complete access to the globe a canthotomy is, as a rule, carried out and, if necessary, the tendinous attachments of one or more muscles are divided. The conjunctiva is kept away from the operative field by sutures held and fixed by artery clamps, so placed that the conjunctiva is thereby held expanded and the sclera kept free. In some cases it is better to fix the sutures farther back in the fascia tenoni, as the conjunctiva may easily be torn. By sutures or hooks in the muscular attachments and by small Jäger's plates, especially designed for the purpose of pushing aside fascia tenoni and the orbital contents, the globe is made accessible to the operator. After careful arrest of bleeding, best done by electro-endothermy (with a needle-shaped active electrode), the endothermal treatment proper is begun.

The large indifferent electrode made up of a lead plate is applied to the leg or thigh; to obtain good contact the lead plate is not fixed directly on the skin, but an intervening gauze pad soaked in common salt solution is applied. The lead plate is bound to the leg by means of a gauze bandage, so as to obtain complete contact over a large surface area. This is important to prevent burns. As the active electrode a metallic ball, 0.66 mm. in diameter and provided with a handle, is employed.

An extremely weak current is used; on contact between the active electrode and the terminal of the indifferent electrode, the amperemeter of the apparatus generally gives a reading of from 1 to $1\frac{1}{2}$ amperes. On contact between the

active electrode and the sclera the current is too weak to give any reading on the amperemeter (less than 100 ma.). At several places, a few millimeters apart, the active electrode is brought in full contact with the exposed sclera for five seconds at the most. To avoid contact with the ciliary body, the treatment is carried out at a respectful distance from the limbus, from 8 to 9 mm. This is done in order not to risk the production of cataract or other complications that may conceivably arise from damage to the ciliary body. The thermal effect on the sclera is evident as an opaque, generally dark-coloured, annular zone corresponding to the place of contact. The sclera is also seen to be flattened out in a peculiar manner near the treated area. The heating being completed in the manner described, trephining of the sclera is carried out within the treated area with an Elliot trephine. This is preferably done at a place corresponding to the most dependent area of the detachment. On carefully dividing the exposed choroid the subretinal contents escape, whether these are made up of a more or less thin fluid or more normal vitreous humour. No bleeding occurs at the trephining wound, probably owing to coagulation of the blood as a result of the preliminary endothermal treatment. The escaping fluid or vitreous humour is washed away with physiological solution of sodium chloride. Trephining is carried out partly with the view of removing subretinal fluid, and partly to prevent a subsequent increase of intra-ocular tension or reaccumulation of subretinal fluid. When the operation has been completed in the manner described, the resected muscles and conjunctiva are sutured. In cases of complete or extensive detachment the operation is confined to the area wherein the hole is located. In cases in which no hole can be demonstrated, and in cases of large detachments, the electro-endothermal treatment is carried out over a larger area, but particularly within that part where the detachment first came into evidence. To this end the history may be of great value.

No serious complications have, as a rule, occurred. The eyes generally stand the operation extremely well. Bleeding occurs relatively rarely. Opacities of the vitreous arise in some cases, but they generally clear up after a longer or shorter space of time. In one patient complications ensued, probably some infection or thrombosis with features simulating tenonitis, hæmorrhage in the vitreous, amaurosis, and, later, atrophy of the globe.

After-treatment.—After both operations of multiple trephining and diathermy the patient is kept in bed with both eyes bandaged for a fortnight. The head is placed as far as possible in such a position that the detached area lies inferiorly, with the view of furthering important mechanical factors that may help to approximate the retina to the eyeball. In the case of a favourable result the patient is then kept in bed for another eight to fourteen days, but without a bandage. **Atropine** is given as long as the eye is inflamed.

The great advantage of both these operations is that in cases when one retinal tear is present no precise localization of the tear is necessary, and thereby the difficult piece of technical work in Gonin's procedure is avoided. Moreover, in cases where several holes are present, multiple operations are avoided by dealing with a large area at one sitting. Furthermore, in both of them less damage is done to the eye, and by exciting a more diffuse reaction in the choroid the retina is attached over a wider area, thus (presumably) lessening the danger of the development of further holes and subsequent recurrences of the detachment. Differentiating between the two last methods, the technique of multiple trephining is very tedious and requires considerable care and delicacy of manipulation; the method of diathermy is easier, shorter, and less open to accident. With regard to results, the percentage of successes

with multiple trephining compares very favourably with those of ignipuncture. The literature is, of course, much less extensive; but in the reviewer's experience at Moorfields Hospital, considering that this operation is done in many cases wherein the size or the number of the retinal tears would negative multiple operations of ignipuncture, the results of multiple trephining are better. In diathermy the results to hand are fewer still and all necessarily of very short after-history. Professor Meller (Vienna) has used it with success in a few cases; Larsson himself reports 20 successes in a series of 40 cases, the list including several cases which from the start were hopeless; and at Moorfields at the time of writing four cases have been operated upon, in three of which the detachment has gone back, while in one it has not. It is much too early yet, of course, to pronounce definitely upon these results, and the proverbial 'beginner's luck' must always be taken into account; nevertheless they are undeniably promising.

Some interesting work has been done upon the pathology of these operations. The histological studies of Herzfeld and Luntz on experimental rabbits' eyes after ignipuncture was noted in last year's MEDICAL ANNUAL (p. 447); T. L. Terry (Boston) has been fortunate in obtaining a human eye for microscopical examination following sclerocautery puncture (the only one on record). The detachment was a traumatic one operated upon on two occasions by Verhoeff in 1923, long before the practice to close a retinal hole was introduced by Gonin. In sections through the first sclerocautery puncture, where vitreous did not present at the time of operation, the retina was completely disorganized and reduced to a thin layer of neuroglia. This layer of neuroglia was fused with a mass of scar tissue, replacing the sclera and choroid. In the scar tissue were irregular nodules of pigment derived from the choroid. Sections through the second sclerocautery puncture, where vitreous presented at the time of operation, showed a similar picture, with a projection of partially hyalinized scar tissue into the vitreous chamber for a distance of 1.5 mm. This projection of scar tissue ended in processes of variable size similar to a paint brush on which paint had dried. Attached to these brush-like processes, and apparently continuous with them, were numerous delicate strands of fibrils that coursed into the vitreous. It will be remembered that Amsler expressed the belief that the success of the operation depends on including vitreous in the scar in order to avoid local traction by the vitreous. At the site of the cautery puncture in this case where vitreous did not present, the retina was just as adherent as at the site where vitreous did present.

The picture in this case is similar to that obtained by Luntz in laboratory animals. It appears, therefore, that following sclerocautery puncture, whether vitreous presents at the operative wound or not, the retina becomes adherent to the scar tissue in the wound, and in the present case this adhesion was sufficient to withstand the traction exerted by a separated retina for eight years.

A very interesting comparative histological study has been made by Mayer (Chicago) on the effects of the three operations under review. He induced an experimental detachment in rabbits mechanically, and treated different animals by ignipuncture, trephining with potash cauterization, and by diathermy. He found that after the first two methods of treatment very extensive tissue destruction took place, which was more marked in the case of ignipuncture; when diathermy was used, however, this was much less extensive. In the study of his sections of all cases, the striking feature was the slightness of inflammatory changes, a finding which is well substantiated by clinical post-operative appearances. On the whole it would seem reasonable to suggest that, provided the retina is safely sealed to the choroid, the method which produces least tissue destruction is preferable.

As the position stands at the moment, it is probable that the ideal operation has not yet been devised. The impetus to new work which the initial success of Gonin's procedure provided has not yet been expended, and further developments will without doubt arise. As a routine procedure the reviewer would prefer at present the technique of Guist, despite its tediousness and its delicacy; it is too early yet to give a considered opinion upon the merits of the newer operation by diathermy.

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RHEUMATISM AND ARTHRITIS.

Dr. J. van Breemen.

In the period May, 1931, to May, 1932, 21 books and 542 pamphlets or articles on rheumatic diseases came under the notice of the International Bureau of the Ligue Internationale contre le Rhumatisme. Of these, 36 articles were of a purely scientific nature; 9 books and 354 articles clinical in conception; 11 books and 144 articles treated of the therapeutic side; and 8 articles of the social side of the problem. After deliberation with the editor it has been divided to place the *clinical* survey in the foreground this year. No review can be given of such a great number of articles, unless a special scheme is followed. The plan developed by the reviewer is as follows: After a few introductory paragraphs, such articles will be first discussed as go more deeply into general rheumatic conceptions in so far as they are of importance to the clinician on the various etiological factors dealt with—namely: (1) The focus; (2) The constitution; (3) The irregularities in the circulation of the skin; and (4) The external factors (climate, occupation, etc.). Next an extract will be given of those articles which deal with general clinical subjects, while thereafter will come a discussion of the abnormalities caused by rheumatism in the various organs, especially joints, muscles, subcutaneous connective tissue, and nerves. Some special clinical aspects will then be considered, and finally the question of prophylaxis and treatment. Rheumatism in children and rheumatic fever are not considered here.

Nomenclature, Schemes, Classifications.—Those articles which deal principally with these topics cannot be reviewed here in detail. For practical, i.e., statistical sociological, purposes, the National Committees affiliated to the Ligue Internationale contre le Rhumatisme have, with fairly great unanimity, adopted the scheme published in the MEDICAL ANNUAL of 1931 (p. 414). To lay down an *international* scheme of medical *scientific* significance would be quite premature just now, because the simplest scientific principles in this field are not generally accepted internationally. That which goes without saying for one national school is strongly denied by another school. According to the present writer, the Council of the Ligue was quite justified in its decision to treat the question of nomenclature as little as possible at Congresses and to consider it in a committee each year, till maturer times should have arrived. It is not of much avail to replace old names by new ones as long as the scientific insight into the problem is still quite insufficient. Those who wish to find their bearings in this field may be referred, *inter alia*, to the articles by J. L. Miller,¹ M.-P. Weil,² Buckley, and Gunzburg.

The important question of the connection between what is called 'rheumatic fever' in the English literature on the subject, acute 'gelenkrheumatismus' in the German, and 'rheumatic state' by many Americans nowadays, and the different forms of chronic rheumatic affections of the joints, is treated by M.-P. Weil and by A. Govaerts,³ Weil defending the thesis that rheumatic fever

has little or nothing to do with chronic rheumatism—a statement which is open to controversy and which is certain to be challenged by many English medical men. His own countryman, G. Etienne,⁴ of Nancy, and M. B. Ansart,⁵ of Madrid, also give examples of the connection between the two groups.

General Theory.—In the opinion of the reviewer the best work produced during the 1931–32 period from a general scientific point of view, was by F. Klinge,⁶ of the Pathological Institute of Leipzig University, partly in co-operation with Currier McEwen of the Rockefeller Institute for Medical Research in New York. This work, which is excellently documented, gives a histologic survey of the general causation of rheumatic affection. The writers could demonstrate, supported by a mass of research material, that, under the influence of bacteria or toxins originating from a primary focus in the body, a special reaction of the organism is sometimes brought about, especially expressing itself in focal lesions of the basic substance of the connective tissue and in the muscle fibres in all parts of the body, in the endo-myocardium, joint capsules, peritoneal tissue, and in the entire vascular system. The Aschoff nodules are a striking instance of these rheumatic abnormalities. These irregularities frequently only appear histologically, without the pronounced picture of rheumatic joint suffering being clinically expressed. Here should be mentioned the investigation work of F. Roulet,⁷ of Berlin, who also looks for the cause in the mesenchyma.

The experimental studies on different animals have, it is true, often contributed a little towards elucidating our conceptions of arthritis, but up till now have failed to give us a real insight into the essence of rheumatic affections.

Etiology.—Good reflections on the different etiological factors of rheumatic diseases are to be found in the survey given by Sir William Wilcox,⁸ who accepts the four factors of the Ligue Internationale as the chief ones in the causation of rheumatism.

The articles by R. Burbank⁹ are also worthy of mention. Besides accepting focal infection, he emphatically points out the importance under special circumstances of decreased powers of resistance of the organism in the causation of rheumatism, whereas T. M. Rivers¹⁰ still represents the typical American standpoint, in which focal infection is wrongly considered to be the only factor.

Factor 1. Focal Infection.—In this field important work was done, amongst others, by H. Bernhardt,¹¹ who investigated the problem of elective localization in the Mayo Clinic and arrived at the same conclusions as Rosenow. Bernhardt's article is a first-class introduction to this point of view.

In 60 patients out of 96 suffering from rheumatoid arthritis, Cecil, Nicholls, and Stainsby could cultivate the *Streptococcus viridans* from their blood. This method was made practicable by J. W. Gray and C. H. Gowen¹² by adding gelatin, glucose, and calcium carbonate to the culture medium as a buffer, in consequence of which the cultures grew much more rapidly. They, too, always found the same streptococci. According to Gray and Gowen agglutination tests are of considerable value in diagnosis.

M. H. Dawson¹³ examined 100 blood cultures, according to the technique of Cecil, Nicholls, and Stainsby, of 80 patients suffering from rheumatoid arthritis. His chief conclusion is that these experiments failed to yield organisms that could be considered of etiologic significance. S. S. Lichtman and L. Gross¹⁴ likewise came to negative conclusions. At the end of their investigations they formulated the following conclusion:—

“Study of 5233 consecutive blood cultures in a general hospital shows that with adequately sensitive methods an incidence of nonhæmolytic streptococæmia (alpha and gamma types) between 4 and 15·5 per cent, with an average of 6 per cent, occurs in at least nine diseases, i.e., acute rheumatic

fever with polyarthritis, chronic rheumatic cardiovalvular disease, rheumatoid arthritis, aplastic anæmia, pernicious anemia, leukemia, colitis, meningococcus meningitis, and pyelitis and pyelonephritis. On the basis of the incidence of the 'transient' streptococemia alone, these organisms cannot justifiably be considered as the causative agents of these diseases."

Muriel Keyes¹⁵ once more points out the connection between uterine ill health, unsatisfactory labours or puerperia, and rheumatism. The reviewer would here like to state that when investigating the initial symptoms of chronic infective arthritis he could, after a very accurate anamnesis, establish a connection between partus (abortus) and the causation of rheumatic suffering in 3 cases only out of 100.

The focal influence of the nasal sinuses in chronic arthritis is treated at great length in a report by S. Fineman et al.,¹⁶ the result of a study of nearly 400 patients during five years.

Factor 2. Constitution, Arthritic Diathesis, etc.—He who wants to be posted up in the great influence which the French school ascribes to 'le terrain', and especially he who wishes to form a clear idea of the great significance attached by many French clinical men to the central laboratory of our organism, 'the liver', can collect excellent data from the different numbers of *Nutrition*. This eminent periodical in different issues gives studies by various authors of good repute of the connection which, according to French conceptions, exists between the liver functions, the arthritic diathesis both in children and adults, and different rheumatic morbid conditions.

It is remarkable how often the significance of the arthritic diathesis has been stressed in Germany by throat, nose, and ear specialists, and now again in a well-documented article by H. Leicher.¹⁷

The question of what part is played in rheumatic conditions by *allergy* bears a relation to the arthritic diathesis, and especially in the last year significance has been attached to it by various men of research.

The present reviewer deems the studies of R. J. Weissenbach and F. Françon¹⁸ to be of importance, especially in view of French conceptions; they point to the great influence of disturbances in endocrine secretion, of the thyroid and ovary in particular.

R. Leriche,¹⁹ of Strasbourg, writes an article stating and explaining the indications for parathyroidectomy in cases of polyarthritis deformans.

Calcinosis circumscripta et universalis is again brought to the fore by H. Steinitz²⁰ and by K. Erb,²¹ the latter pointing out the influence of trauma in people with an enhanced percentage of calcium in their blood; in these cases changes were not demonstrable in the skeleton.

The article by G. Perémy and K. Feledy,²² of Budapest, gives an excellent idea of the rôle of amino-nitrogen combinations in several articular affections.

Factor 3. Troubles in the Blood Circulation of the Skin.—In a number of *Nutrition* which is entirely devoted to "troubles de la circulation périphérique", Laignel-Lavastine²³ gives an outline of the rôle of the sympathetic system in chronic arthritis. His views approach those of Llewellyn Llewellyn, who also gave prominence to 'le déséquilibre sympathique'. In this connection mention should be made of the article by B. S. Nissé,²⁴ who also deals with the disturbances in the blood circulation of the skin in chronic arthritis, but from another point of view.

Factor 4. External Factors: Climate, Trauma, Occupation.—Much more attention is being paid to the influence of these factors.

M. Ory²⁵ (Liège), supported by the editor of the *Acta Rheumatologica*, has appealed to various workers to make a more methodical study of the meteorological factors in rheumatism. The best documented work in this field,

which may undoubtedly serve as an example to many others, is a meteorological, physical-physiological study of the climate of Assuan by C. Dorno and F. Lahmeyer.²⁶

The experimental investigation of 'Erkaeltungs-catarrhe' by P. Schmidt²⁷ is also very important, both for its facts and its theories. It shows how the negativism which used to predominate at the German universities in respect of the 'catching cold' problem is gradually giving way to quite a different attitude. In this connection the studies by W. Storm van Leeuwen,²⁸ A. A. Friedlaender,²⁹ T. Longcope,³⁰ E. Flach,³¹ and R. Schoen,³² are also worth noting.

Everything tends to prove that in the future the close co-operation of physician, physicist, and meteorologist will serve considerably to augment our positive knowledge in this province.

The articles by G. Edström³³ and M. M. Kutyrin³⁴ in their respective manners also furnish an excellent analysis of the influence of the weather on rheumatic patients.

Trauma.—This important industrial factor, so very pronounced in some occupations, immediately obtrudes itself here. Fischer, of Aachen, Buckley, and others, point out the great importance of a trauma repeated again and again which may in some trades lead to pronounced arthritis. A striking instance is the so-called compressed-air disease, described by M. P. Moulouguet-Dolérès³⁵ in a meeting of the Ligue française contre le Rhumatisme. The influence of a repeated trauma in numerous cases of arthritis of the spine is also increasingly seen.

General Clinical Views.—Among the articles published in Germany which give general theories of a clinical nature, those by A. Fischer,³⁶ of Aachen, and S. Hoffheinz³⁷ are especially recommended.

A remarkable amount of interest was evinced by the French—M. M. F. Bezancon and M.-P. Weil,³⁸ R. Ardillier,³⁹ R. J. Weissenbach, Françon and their assistants.⁴⁰

A new form of chronic fibrous articular rheumatism is described by G. Marinesco and G. Allende⁴¹; the familial occurrence of this affection is strongly stressed.

From the English side general opinions of a clinical nature were given by F. Bodman,⁴² C. W. Buckley,⁴³ Sir William Wilcox,⁴⁴ and A. Renshaw,⁴⁵ in which the methodic investigation is led into new channels.

The Americans, too, wrote numerous articles. The reviewer would especially recommend the perusal of the thorough studies by Millard Smith,⁴⁶ J. Miller,⁴⁷ and H. Keller⁴⁸ (New York).

Gradually the opinions in Germany on primary progressive arthritis deformans generalis are being modified, the conception of 'infective arthritis of unknown cause' getting more adherents. In this way the English standpoint is being approached.

J. B. Mennell's booklet, *Backache*, published this year⁴⁹ is a great acquisition to clinical examination. This study is the result of upwards of twenty years' regular work in a well-defined domain—"the methodic investigation of the normal and pathological relations between the vertebral column and the connected joints". It is striking how simple this work is, and yet his accurate research work holds the key to the success of many practitioners not belonging to the medical profession. This is a manual which the reviewer can warmly recommend to any medical man interested in the accurate examination of a rheumatic patient.

Allied Morbid Conditions; Differential Diagnosis.—An interesting article has been written by A. M. Brogsitter,⁵⁰ of Munich (now at Berlin), in

which many differential diagnostic characteristics are expounded, both clinically and roentgenologically, with great erudition. The reviewer can warmly recommend this article.

The question as to what may ultimately be called rheumatic and what not is expressed in different articles, and, according to the reviewer, it is a futile query as long as our knowledge remains so deficient.

It is remarkable how the interest in *gout* has temporarily declined. This time, too, the communications on this subject (ten in number) are nearly all of a fragmentary nature and principally treat of the therapy. Good contributions are those by Ludwig von Pap⁵¹ (Budapest), L. C. E. Calthrop,⁵² and K. Harpuder⁵³ (Wiesbaden). There are, further, some short communications by L. Schmidt⁵⁴ (Pistany), E. Cmunt⁵⁵ (Prague), and P. Rondoni.⁵⁶ A study worthy of note is that by A. Schültz⁵⁷ on the relation between leukæmia and gout. We should also mention the articles by F. Coste, J. Forestier, and J. Lacapère,⁵⁸ and by Weissenbach and Françon,⁵⁹ all of which deal with the question whether there is a 'rhumatisme goutteux', in the sense in which especially Teissier introduced the conception into France. The reviewer inclines to the opinion that this clinical picture has a *raison d'être* and is frequently met with in women, being often described as chronic gout in the English literature on the subject.

Lungs, Intestines.—On the French side attention is once more directed to rheumatic pleuritis, which may sometimes occur alternately with manifestations in the joints.

Peritonitis rheumatica is also described on different sides. *Nutrition*, Vol. II, No. 2, is entirely devoted to the influence ascribed by the French to the intestines on different forms of rheumatic affection. This journal can be recommended to anybody wishing to obtain a knowledge of the conceptions of the French school on this point.

G. Monod⁶⁰ (London) deals with cellulitis as a symptom of liver trouble, while R. J. Weissenbach, R. Clénard, and F. Françon,⁶¹ in an excellent way take stock of the different forms of rheumatism which are, according to them, connected with it. Hyperuræmia without manifest gout symptoms (an illness of frequent occurrence) and 'le rhumatisme oxalémique' are regarded by them as being mainly caused by disturbances in the liver function. A number of papers (G. Maranon and M.-P. Weil,⁶² M. Loeper,⁶³ G. Etienne and P. L. Drouet,⁶⁴ and M. Labbé⁶⁵) deal with kindred subjects, and W. H. Dickson,⁶⁶ of Toronto, publishes a paper on colonic changes in chronic arthritis.

Bacteriology of the Blood.—The sedimentation test, both in rheumatic fever and in chronic rheumatic affections, is now firmly established, being at present generally used in Scandinavia, Germany, France, Belgium, Holland, etc., and in many places in England for the following purposes:—

1. As a reliable guide to make out whether a rheumatic fever may be regarded as cured and the patient as able to work (it frequently happens, when the clinical symptoms have disappeared but the sedimentation test is not yet normal, that the patient is prone to relapse; the present reviewer has often confirmed this).

2. As a more or less reliable guide to determine the infectious character of the rheumatic arthritis and to give a special indication as to the prognosis, if repeated tests are made.

W. H. Bendien and I. Snapper⁶⁷ deal in an excellent manner with the connection between the sedimentation and the plasma proteins, coming to the conclusion, also as a result of their investigatory work, that the sedimentation rate is always proportionate to the fibrinogen increase of the plasma.

E. Gold⁶⁶ has investigated the calcium and phosphorus metabolism in the acute stage of ankylosing polyarthritis, and found the function of the parathyroid normal.

An important study is devoted by H. A. Terray,⁶⁹ of Aix-les-Bains, to the alkaline reserve, especially in connection with the influence of different mineral waters on this condition.

The communication by Edith E. Nichols and W. J. Stainsby⁷⁰ that rheumatoid arthritis can be differentiated from osteo-arthritis, chronic gout, gonococcal arthritis, and other joint diseases by the agglutination reaction, has aroused great interest, and for obvious reasons, for each new aid, to the better diagnosis of the dread illness, rheumatoid arthritis, is of great moment. For further technical information the reader must be referred to the original communication.

The problem presented by the presence of tubercle bacilli in the blood of rheumatic patients is treated by C. Reitter and E. Löwenstein, of Vienna.⁷¹ The statements made by these two authors are sufficiently known from numerous publications. These investigations have been repeated by various people in different countries, a controlling experiment being made in a few cases by examining a blood specimen in a bacteriological laboratory in the home country and then forwarding a sample of the same blood to Vienna to be examined. Only a few positive cases could be proved in this way, so that great caution should be exercised on this point for the time being.

H. Bernhardt and P. S. Hench⁷² state the results of an investigation to check Cecil, Nichols, and Stainsby's findings, with a negative result. Hench here mentions the difference in technique, pointing out the probability that the Arnold apparatus used by Nichols does not sufficiently sterilize media.

J. W. Gray and C. H. Gowen⁷³ give an extensive account of their study of the alpha type of streptococcal infection in arthritis deformans. This readable article fully deserves attention.

Though the reviewer cannot judge of the correctness of E. C. Rosenow's⁷⁴ research work and his theory of electivity, he deems the important and well-documented article in the *Acta Rheumatologica* to be worthy of notice. The investigations by Hill and Tareef⁷⁵ should be mentioned too.

Skin, Subcutaneous Tissue, Muscles, Nerves.—The connection between skin diseases (psoriasis, eczema) and arthritis is once more described by J. Bauer and A. Vogl,⁷⁶ several cases being brought forward.

Other investigatory work of importance is that of J. M. Caldwell, jun., and J. G. Mayo,⁷⁷ in connection with cutaneous reactions to histamine; they arrive at the conclusion that "especially the time which elapses between administration of the drug and the formation of wheals is of value in determining whether or not the blood-supply to the skin of the extremities is reduced".

S. Bettmann⁷⁸ deals with the important question as to whether the skin type can give certain constitutional indications; up till now little of a positive nature has been found in this direction.

M.-P. Weil⁷⁹ and H. J. Shelley⁸⁰ both write good articles on calcification in the subcutaneous tissues, while Brandligt,⁸¹ who has been making a study of cellulalgia (panniculitis, adiposalgia) for some years past, gives a readable article on this subject.

A chronic form of rheumatic affection of tendon sheaths and mucous bursæ is described as 'hychromatosis rheumatica' by H. Günther,⁸² of Leipzig. This affection, which is of fairly rare occurrence, is (according to the writer) mostly, and quite incorrectly, regarded as being of tuberculous origin.

In the field of rheumatism of the nerves few new publications saw daylight.

Good general surveys were given by V. Coates,⁸³ P. Schober,⁸⁴ and G. I. Labat and M. B. Green.⁸⁵ A remarkable effort was the very critical but eminent article by F. C. Purser⁸⁶ on the nature of sciatica.

Sciatic scoliosis is once more treated by S. Kleinberg⁸⁷ and by D. S. Macnab.⁸⁸

Joints, Arthritis.—How far is arthroscopy of use to the closer clinical study of arthritis? According to M. S. Burman,⁸⁹ of New York, who writes an excellent study on the subject, the clinician may frequently derive benefit from this new method of research.

J. de Mol,⁹⁰ of Otterloo, gives a good study from Lameris's Clinic of inflammation of the epiphyses accompanied by chronic arthritis of non-tuberculous origin.

Research work on the synovial fluid is continued by D. H. Kling,⁹¹ of New York, A. Fischer,⁹² of Aachen, and by E. Krummel.⁹³

Good experimental work was also done by J. A. Key⁹⁴ and E. H. Ryneerson,⁹⁵ who, as a result of experiments, came to the conclusion that the synovial membrane has specificity in its reaction to intra-articular material, as illustrated by dyes.

J. F. Brailsford,⁹⁶ R. Kienböck,⁹⁷ and S. G. Scott⁹⁸ furnished first-class articles on X-ray diagnosis.

General observations of clinical significance have been made by M. J. Shapiro⁹⁹ and R. B. Osgood.

The recent tendency to identify and classify the different forms of arthritis according to their origin as far as possible, is somewhat counterbalanced by assuming a mixed form of chronic arthritis in many cases (B. H. Archer,¹⁰⁰ V. Coates¹⁰¹).

A well-documented study on arthritis in connection with scarlet fever was furnished by H. Zischinsky.¹⁰² Good communications on gonorrhoeal and syphilitic arthritis were published by Brizio and Torreri,¹⁰³ Timofeev,¹⁰⁴ and S. Neumark.¹⁰⁵

How great is the influence of syphilis on rheumatic arthritis and what is the value of potassium iodide preparations in these forms of chronic arthritis? It is known to the reviewer that in some countries more than 60 per cent of the cases of arthritis are said by certain authors to be of syphilitic causation, whereas a number of writers from other countries consider this syphilitic influence to be negligible. Let us utter a warning here against off-hand generalizations on the strength of communications from some particular country.

Special Clinical Aspects.—

Rheumatoid Arthritis (Arthritis Deformans Generalis, Chronic Rheumatic Infective Arthritis).—We incline to the opinion that for the present it will be sensible, in view of our lack of knowledge of the causes, to group together these forms, in which the rheumatic nature is manifested in distinct articular abnormalities. The old clinical conception of rheumatoid arthritis has undoubtedly undergone a considerable change and dissection in the last decade, but it would appear wise to the reviewer not to jettison this clinical concept before we can fill the gap with better etiological factors.

This opinion is shared by V. Coates and L. Delicati,¹⁰⁶ who wrote an excellent booklet on rheumatoid arthritis. The reviewer realizes that not all English medical men will subscribe to the conviction of these authors, but the latter have certainly rendered a signal service to medical science by their accurate analysis of various symptoms, their excellent clinical descriptions, and most decidedly to physicians on the Continent, who, as experience teaches, meet with great difficulties in their attempts to get a clear clinical picture of rheumatoid arthritis. These difficulties are caused by two facts, the first being the great divergence between the conceptions of the Germans and the

French on this subject, the second being the greater incidence of rheumatoid arthritis in England than elsewhere.

This disease is still in the limelight of clinical interest. What is the kinship between rheumatic fever and rheumatoid arthritis? This question is answered differently by different investigators, and it is the opinion of the reviewer, too, that cases are frequently met with in which a diagnosis is extremely difficult. J. Schneyer¹⁰⁷ writes about the prognosis. He seems to be rather optimistic. R. L. Cecil and his collaborators¹⁰⁸ maintain (clinically, too) their well-known conception that rheumatoid arthritis is a result of infection (in the majority of instances) with *Streptococcus hæmolyticus*.

Rheumatoid Tuberculeux.—Can some cases of rheumatoid arthritis or infectious chronic rheumatic arthritis be a manifestation of a mild form of tuberculosis? This most important question, brought forward by Poncet and his pupils, is frequently answered in the affirmative in different countries, especially in France and Italy, whereas in other countries this affinity is denied or ignored. In connection with the third International Congress on Rheumatism of the Ligue Internationale contre le Rhumatisme, at which this subject will be officially treated, several prodromal articles have been published. (See also BACTERIOLOGY OF THE BLOOD, p. 411.)

Climacteric Arthritis, Disturbances in the Internal Secretion, etc.—While certain papers on these subjects are referred to under *Factor 2* (p. 408), attention may here be directed to a number of articles of a more clinical nature, among others that by M. R. Simon,¹⁰⁹ in which the influence of the thyroid on some cases of arthritis deformans is discussed. Further, the articles by S. J. Essenson,¹¹⁰ Ludwig von Pap¹¹¹ (Budapest), and P. D. Howitt and W. P. Cristie¹¹² are worthy of mention here.

'Lipoarthritis sèche bilatérale et symétrique des genoux', repeatedly described by F. Françon,¹¹³ must also be linked up with internal secretion irregularities.

We find 'les arthropathies' described as the chief symptom of hæmophilia by P. E. Weil and R. Massart¹¹⁴ in a detailed and well-documented article.

Osteo-arthritis.—Of recent years a distinct change has been noticeable in the study of the above subject. Whereas, formerly, mainly the pathologico-anatomical side was brought to the fore and studied, the functional study and that of the causes now claim most attention. It need scarcely be said that, from the therapeutical standpoint and for a better insight into the problem, this is a considerable step forward. The question whether osteo-arthritis is a real '-itis' or only 'osteo-arthrosis', is dealt with from different sides. The reviewer thinks that, however correct this designation (introduced by von Mueller, of Munich) may originally have been, inflammatory phenomena frequently play a leading part in this process, which is principally based on wear and tear and on chronic trauma in consequence of static disproportion. The contributions by H. Schütz,¹¹⁵ Pap Lajos, F. J. Lang,¹¹⁶ E. Just,¹¹⁷ L. Petschacher,¹¹⁸ P. Figdor,¹¹⁹ and M. B. Ray,¹²⁰ all point in this direction.

A remarkable case is mentioned by J. Gaté and his assistants,¹²¹ viz., one of osteo-arthritis, undoubtedly traumatic in origin, in which the picture of a tertiary lues developed. The reviewer's experience teaches him that this is no rarity and the picture of osteo-arthritis need not be limited to syphilis, for often gonorrhœa, tuberculosis, and more banal infections are of great consequence in the secondary complications.

An article by Klinge¹²² claims our attention. As usual, he is very thorough in his work, and he gives important particulars about the experimental causation of osteo-arthritis.

A. C. Belmonte¹²³ points out the occurrence of a benign sort of arthritis of the hip-joint which often presents great diagnostic difficulties.

Arthritis of the Spine.—There has been a heavy crop in this field this year. Excellent articles were published on all sides. In the first place attention should be directed to the series of articles by H. Junghanns,¹²⁴ of Professor Schmorl's Pathologico-anatomical Institute, who gives a methodical description (both pathological, anatomical and roentgenological) of the natural changes taking place in the spinal column as we grow older. In this way a foundation is laid for more effective clinical work, as up to the present there has frequently been little to go by in respect of the normal and abnormal X-ray pictures and in pathologico-anatomical preparations. In this domain Junghanns has greatly enhanced our knowledge with his pre-eminent research work.

The problem as to the connection existing between old bone fractures and spondylitis deformans, which is of such great moment both from the medico-scientific and the medico-industrial points of view, is gone into deeply by H. Hellner.¹²⁵ His article is warmly recommended to the notice of the readers of the MEDICAL ANNUAL, and so are the contributions by E. Plate¹²⁶ (Hamburg) and Ernst Freund¹²⁷ (Vienna).

C. W. Buckley¹²⁸ (Buxton) also gives a thorough exposition of his views in respect of spondylitis deformans, admirably setting out this complicated and intricate problem (confused especially by the variety of names). His point of view that Bechterew and Marie-Strümpell are often not to be separated is shared by the reviewer. The greatly divergent conceptions in regard to the influence of syphilis on these vertebral affections will probably be connected with the widely different occurrence and the difference in the intensity of treatment in different countries and regions.

THERAPY AND PROPHYLAXIS.—The number of articles dealing with the treatment of rheumatism is, unlike in previous years, small. Not many new vistas are opened up. The **Histamin Iontophoresis**, originally propagated by Deutsch and taken over by several others (R. Trumpp,¹²⁹ Pap Lajos), must be mentioned here. S. M. Miller,¹³⁰ of Chicago, expresses his great satisfaction with epidermal injections of **Novocain**. The **Gold Salts** injections introduced into France by J. Forestier¹³¹ are discussed in an article.

The favourable influence of physical procedures, **X-ray Treatment** in particular, is extensively expounded by G. Kahlmeter,¹³² of Stockholm. This treatment, as the present reviewer stated in last year's ANNUAL (p. 458), deserves much more interest than has hitherto been bestowed upon it. Dausset, of Paris, also records many successes with X-ray treatment in arthritis of the hip and other cases, and so does P. Padovani.¹³³

Little has been written about **Balneotherapy** this year. F. E. Dawson,¹³⁴ of Droitwich, again draws attention to *brine* therapy.

Therapeutically speaking, rheumatoid arthritis is still a very ungrateful subject, so that each new serious therapeutical publication is deserving of notice. In this connection attention is drawn to W. S. C. Copeman's¹³⁵ article on the treatment of true rheumatoid arthritis by **Blood Transfusion and Insulin**.

A. W. Douthwaite,¹³⁶ F. T. Cadham,¹³⁷ I. H. Lloyd Williams,¹³⁸ M. B. Ray,¹³⁹ and J. Kowarschik¹⁴⁰ deal with the treatment of rheumatoid arthritis in a general way.

It will rarely happen that **Opium** or **Morphine** are resorted to in treating rheumatism. E. H. Ryneerson and P. S. Hench¹⁴¹ mention some instances of patients who derived great benefit from morphia. The vague limits to the conception of rheumatism make any control difficult.

A detailed study of the influence of a special **Diet** came from the laboratory of Professor M. I. Pewsner,¹⁴² of Moscow. The favourable results once more suggest the importance in special cases of a regimen, frequently neglected by physicians and often prescribed by quacks.

Vaccine Therapy has enjoyed most interest this year. The articles by M. Shuster,¹⁴³ P. M. Congdon,¹⁴⁴ A. E. Vipond,¹⁴⁵ and R. Burbank and B. E. Christensen¹⁴⁶ demand most attention in this respect. M. Wetherby and B. J. Clawson¹⁴⁷ give a detailed study of intravenous injections with vaccine.

INDUSTRIAL ASPECTS.—In the first place the reviewer would draw attention to the effort made by the American Committee for the Control of Rheumatism, who in their "Outline of Factors Influencing the Onset of and Recovery from Chronic Arthritis" performed excellent work.

Great significance is also to be attached to W. S. C. Copeman's¹⁴⁸ contribution, "The Control of Industrial Rheumatism". In it the writer gives a very clear survey of the features of the methodical campaign against rheumatism in England; it is a very readable effort.

From an industrial standpoint and from the organizer's point of view R. B. Osgood's¹⁴⁹ article is of great interest, as also is that of H. Keller.¹⁵⁰

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RIFT VALLEY FEVER.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

In 1931 R. Daubney, J. R. Hudson, and P. C. Garntam¹ described under the name of 'Rift Valley fever', or 'enzootic hepatitis', a rapidly fatal epidemic disease, with focal necrosis of the liver, among ewes and lambs on a farm in the Rift Valley. They found the disease to be due to a filterable virus. In the course of their investigation four Europeans engaged on the work developed a mild dengue-like fever of twelve to thirty-six hours' duration, with rigors and pain in the back. Inquiry showed that almost every native engaged with the infected flocks had been attacked by this fever, and a native volunteer developed the fever on the third day after being inoculated with the filtered virus; his blood proved infective to sheep nine days after being inoculated with it. The disease did not appear to be contagious, but it is thought that a mosquito, *Taniorhynchus brevipalis*, may be the carrier of the infection. G. M. Findlay² reports subsequent work on this interesting condition. The virus in infected blood was brought to this country preserved in oxalate-carbol-glycerin, and lambs were infected with it by Major Dalling, who, together with his assistant, contracted the fever through performing post-mortem examinations on the lambs. Inoculation of the virus intraperitoneally produced fever in two monkeys (*Macacus rhesus*), and mice and rats proved very susceptible, but rabbits, guinea-pigs, and chickens were immune. The virus will pass through Berkefeld filters N.V. or W. Infected mice always die in one to four days. Dr. Finlay's laboratory assistant contracted the fever from virus after prolonged passage through mice.

In man, as judged from laboratory infections, after an incubation period of five to six days, fever of three days' duration and up to 102° to 103° F. ensued with pains in the back and legs, epistaxis, profuse sweating, and weakness for some days during convalescence, but no enlargement of the spleen. The blood at the height of the fever proved infective to mice, and a polynuclear leucocytosis was present, but the urine was not infective. In another case the

saddle-back temperature curve was seen with a fall on the third day followed by a secondary rise on the sixth day to 108° for one day with some muscular pains, and in a third case the fever lasted ten days with somewhat prolonged convalescence. A week after the fall in temperature the patients' blood showed protective antibodies against infection in mice, and this persisted five months later. The fever has also been studied in fourteen *Macacus rhesus* infections with an incubation period of one to three days and fever for one to five days with little effect on the general health. Monkeys could be infected by subcutaneous, intraperitoneal, or intracerebral inoculation and by intranasal instillation, as with yellow fever and vaccinia. Infection could also be produced in goats, cats, wood-lice, field voles, dormice, the golden hamster, and the grey squirrel, as shown by their blood becoming infective to mice. In mice dilutions up to 1-1,000,000 always infected. In the most susceptible animals, such as sheep and mice, a focal necrosis of the liver is produced with a fine fatty degeneration of the liver parenchyma. Serum tests gave no indication of Rift Valley fever being related to yellow fever.

J. C. Broom and G. M. Findlay³ report on complement-fixation in this fever, and conclude that with an antigen of the livers of infected rats and mice specific complement fixation occurs with the sera of recovered men and animals roughly proportionate to the severity of the clinical symptoms, and that antibodies are present in the serum from fourteen days after infection up to at least six months, and they may appear in those exposed to infection in the absence of any definite illness. R. Daubney and J. R. Hudson⁴ report that the only two African monkeys yet tested failed to react to the virus of Rift Valley fever, although Asiatic ones do so readily.

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RINGWORM. (See SKIN, FUNGUS AFFECTIONS OF.)

SALIVARY GLANDS, RADIOGRAPHY OF. (See RADIOGRAPHY.)

SCARLET FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to official statistics,¹ during 1930, 117,077 cases of scarlet fever were notified in England and Wales as compared with 120,232 in 1929. There were 741 deaths, a case-mortality of 0.6 per cent, which differs little from the corresponding figure for any of the last six years. The mildness of the disease is largely responsible for the increased incidence, as unattended and overlooked cases are not uncommon.

In a study of the Dick test among 2081 Japanese and 481 Chinese in Southern Manchuria, K. Ando, H. Nishimura, and K. Osaki² found a positive reaction in 759 (36.5 per cent) of the Japanese and in 77 (17.9 per cent) of the Chinese. They explain the difference in the incidence of the disease in the two races by a difference in predisposition, as in the case of the American Indians, who are comparatively insusceptible to scarlet fever. There does not appear to be a higher proportion of negative reactions among Japanese children who have been born or lived for a long time in Manchuria, where scarlet fever is more prevalent, than among those who have lived for a long time in Japan or have only recently immigrated to Manchuria.

According to R. Pollitzer,³ bacteriologist to the Manchurian Plague Prevention Service, scarlet fever is practically absent or very mild in South China, not unduly severe in Shanghai and the Central Provinces, but severe in the North. The disease, while comparatively more frequent among foreigners in China, is decidedly more virulent among the Chinese.

SYMPTOMS AND COMPLICATIONS.—J. Comby,⁴ like the reviewer, maintains that *relapses*, which take place soon after the primary attack and are due to recrudescence of the disease, and *second attacks*, which arise a considerable time after the first, and are due to re-infection following loss of immunity, undoubtedly occur, so that a child who has already had one attack should not be regarded as immune to the disease.

H. L. Babcock⁵ reports an incidence of 185 cases (8.19 per cent) of *otitis media*, of which 21 (11.3 per cent) developed *mastoiditis*, among 2280 cases of scarlet fever. The interval between the onset of otitis and that of mastoiditis ranged from four to fifty-one days, but in most cases was more than a fortnight. Of the 21 cases of mastoiditis 7 had had *Myringotomy* performed, and in 14 the drumhead had ruptured spontaneously, which is definite evidence in favour of myringotomy.

An exceptional case of *œdematous laryngitis* necessitating tracheotomy, complicated by *serofibrinous pleurisy* and ending in recovery, is reported by J. D. Rolleston and D. G. Macpherson.⁶ The patient, a woman of 22, was admitted to hospital with a mild attack of scarlet fever which became complicated by bilateral cervical adenitis on the sixth day. The fauces subsequently became œdematous and on the tenth day she developed urgent dyspnoea, so that tracheotomy had to be performed *in extremis*. The tube was removed in two days, but much cellulitis and ulceration of the tracheal cartilages with perforation of the right lateral wall of the trachea took place. Right pleuropneumonia developed and 120 c.c. of straw-coloured fluid were removed from the right pleural cavity. Direct examination of the fluid showed polymorphonuclear leucocytes, and a pure growth of hæmolytic streptococci was found on culture. Finally, complete recovery took place. In the writers' experience, it was unique for mild scarlet fever to be complicated by Ludwig's angina with œdema of the larynx necessitating urgent tracheotomy.

F. G. Wood-Smith,⁷ who reports a personal case, states that *purpura* is a rare complication of scarlet fever. Both sexes are equally affected, but children more commonly than adults. The complication, which is probably due to capillary damage caused by the toxin of the scarlatinal streptococcus, may appear in any type of scarlet fever, the usual time for its occurrence being the third week of the disease. The platelet count is often decreased, but may be normal. All forms of purpura in varying degrees of severity may be found, including purpura fulminans, of which the reviewer has seen several examples. Wood-Smith's case was that of a medical man, age 26, who on the fifteenth day of a severe attack of scarlet fever treated by antitoxin developed a purpuric rash on the limbs preceded by a rise of temperature, cervical adenitis, and albuminuria. Apart from a moderate thrombopenia the blood-count was normal. Fresh crops of purpura appeared on the twenty-first, thirty-first, and forty-fifth days of disease, after which convalescence was uneventful.

C. Shookhof and L. M. Tavan⁸ report the following *electrocardiographic* observations on 50 children aged from 5 to 13 years suffering from scarlet fever, which was mild in 41, moderately severe in 8, and severe in 1. The cardiac rate did not differ from that of normal children in the same age-group. When fever was present the increase in rate was commensurate with the rise in temperature. A relative bradycardia, beginning in the second week and returning to normal at the end of the third week, was found in 25 per cent. Sinus arrhythmia occurred just as frequently as in normal children. No prolongations of the P-R interval were observed. Only minor changes in the T or R-T waves were noted in 10 per cent, and the normal condition was restored before the patient left hospital. An abnormal axial deviation during the disease was noted in 16 per cent, but with one exception returned to

normal before the patient's discharge. These findings differ from those described in rheumatic fever in : (1) The comparative infrequency of electrocardiographic evidence of myocardial involvement ; (2) The absence of any tendency for abnormalities to persist ; and (3) The absence of prolongation of the P-R interval.

S. van Creveld⁹ investigated the *liver function* with lævulose and galactose in thirty-five children aged from 6 to 12 years who had mild attacks of scarlet fever, and found that in the early stage only a few presented slight changes in the blood and urine which could be detected exclusively by galactose. After the clinical symptoms of hepatic insufficiency occurring in the early stage had subsided, the disturbance of carbohydrate metabolism became increasingly frequent in the following weeks and was even perceptible in the sixth week. In catarrhal jaundice, which is an occasional sequel of scarlet fever, the tolerance for galactose is considerably reduced, but in 15 cases examined the tolerance for lævulose was not definitely affected.

From his experience at the Bucharest Children's Hospital during the period 1927-30 O. Millian¹⁰ comes to the conclusion that *tuberculosis* may be a factor in the malignancy of scarlet fever. He records nine fatal cases in children aged from 2 to 16 years in whom tuberculous lesions of the tracheo-bronchial glands, miliary tuberculosis of the lungs, pleural adhesions, caseous mesenteric glands, meningitis, or caseous pneumonia were found post mortem. The malignant character of the association of scarlet fever with tuberculosis is probably due to the fact that both diseases tend to produce insufficiency of the liver and suprarenals, both of which possess important antitoxic properties.

PROPHYLAXIS.—The subject of *return cases* of scarlet fever and their prevention was discussed at the First International Congress of Preventive Pædiatrics,¹¹ held at The Hague in September, 1930. Professor von Gröer maintained that individual attention and disinfection, including frequent baths, sufficient supply of clean linen, careful attention to the nose and throat of the patients, who should be kept as much as possible in the open air, and supervision of the other members of the family were the only reliable means of prevention of return cases. The duration of the patient's stay in hospital should not be determined by the presence of streptococci in his nose or throat. Mild cases could be discharged in twenty-eight days, but complicated cases should be detained longer. Serum treatment has no effect on the contagiousness of convalescents. A. Lichtenstein, who estimated the frequency of return cases at about 3 per cent, maintained that they could best be prevented by the following methods : (1) Careful examination of the patient before leaving hospital, with special attention to purulent discharges from the nose, throat, or ear, or any rise of temperature. (2) Prolongation of the period of isolation when any symptoms were present. (3) Special precautions in the case of patients to be discharged to large families or children's homes. (4) Establishment of fresh-air stations for convalescents. (5) Immunization of the children remaining at home before the patient's discharge. B. Schlesinger regarded active immunization as the most hopeful method of diminishing the number of return cases. Active immunization had been carried out at the country branch of the Hospital for Sick Children, Great Ormond Street, for the last three years, during which period no epidemic of scarlet fever had arisen, although two small outbreaks had occurred before. In the main hospital passive immunization was given to all Dick-positive patients in a ward when a sporadic case of scarlet fever arose.

J. D. Rolleston,¹² after relating the pioneer work done in England in connection with return cases, stated that recent investigations had shown that the proportion of return cases ranged in different British hospitals from 0 to 8.9

per cent. His own experience confirmed the principal conclusions of his predecessors as regards the unimportance of desquamation, the frequency of rhinitis among infecting cases, the higher incidence of return cases in the cold seasons of the year, the ages of the infecting cases (the majority being between the ages of 8 and 10 years), and the highest incidence of return cases within the first fortnight of the patient's discharge from hospital.

G. Schreiber¹³ addressed a questionnaire to 12 French and 11 foreign physicians as regards their opinions as to the *duration of isolation* in scarlet fever. The minimum was that of 21 days given by Cohn (Brussels) for mild cases. Gautier (Geneva) regarded 23 to 30 days, and Marfan (Paris) 27 days, as sufficient in such cases. Rolleston and Schlesinger (London) held that uncomplicated cases could be discharged at the end of four weeks. Lichtenstein (Stockholm) was in favour of 25 to 28 days, while Gorter (Leyden) and Schlossmann (Dusseldorf) recommended 30 days for mild cases. Similar views were expressed by most of the other authorities except Comby and Dopfer (Paris), Mouriquand (Lyons), Morquio (Montevideo), and Taillens (Geneva), who advocated a minimum isolation of 40 days for all cases. In complicated cases and especially those with discharges from the nose or ear it was generally agreed that the isolation should be prolonged beyond the 40th day.

P. S. Rhoades¹⁴ found that the Dick test was a reliable indication of immunity to scarlet fever, as no cases developed among 533 nurses with negative reactions, whereas there were 15 cases during the same period among 449 nurses who were either Dick-positive or were neither tested nor immunized. Immunization with five doses of scarlet fever toxin of 500, 2000, 8000, 25,000, and 80,000 skin-test doses respectively was successful. No scarlet fever developed among the 298 nurses who received the full series of doses, whereas 14 cases occurred among 449 who had had no immunizing doses, and there was one case in a nurse who had had only three doses.

REFERENCES.—¹*Ann. Rep. C.M.O. Min. of Health*, 1931, 57; ²*Bull. Off. internat. d'Hyg. publ.* 1932, 620; ³*Rep. Manchuria Plague Prevention Service*, 1929-30, 134; ⁴*Arch. Mèd. Enf.* 1932, 209; ⁵*New Eng. Jour. Med.* 1931, ccv, 1149; ⁶*Clin. Jour.* 1931, lxi, 41; ⁷*Brit. Jour. Child. Dis.* 1931, 473; ⁸*Amer. Jour. Dis. Child.* 1931, xlii, 554; ⁹*Nederl. Tijds. v. Geneesk.* 1931, 5301; ¹⁰*Arch. Mèd. Enf.* 1932, 129; ¹¹*Brit. Jour. Child. Dis.* 1931, 314; ¹²*Ibid.* 1932, 91; ¹³*La Clinique*, 1932, 135; ¹⁴*Jour. Amer. Med. Assoc.* 1931, xcvi, 153.

SCHISTOSOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

The prognosis of schistosomiasis hæmatobium is discussed by R. Girges,¹ who considers unfavourable factors to be old age, severe anæmia with hæmoglobin below 30 per cent, frequent micturition, and septic infections. In the diagnosis of intestinal schistosomiasis by sedimenting the ova in the stools as an aid to microscopical examination, J. W. Tomb and M. M. Helmy² advise the use of a common salt solution of a strength of 0.7 per cent to avoid the eruption of the miracidia.

TREATMENT.—A case of schistosomiasis hæmatobium complicated with jaundice is reported by F. G. Cawston³ which was successfully treated with 1 to 2 c.c. doses of Fouadin* intravenously with a total dosage of 18 c.c. in three weeks.

REFERENCES.—¹*Jour. Trop. Med. and Hyg.* 1931, Oct. 1, 397; ²*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, Nov. 11, 181; ³*Jour. Trop. Med. and Hyg.* 1931, Oct. 1, 317.

SCHIZOPHRENIA. (See DEMENTIA PRÆCOX, DYNAMISM IN; MENTAL DISEASE; PSYCHOSES, PATHOLOGY OF.)

* Bayer Products Ltd., 19, St. Dunstan's Hill, London, E.C.3.

SCLEROSIS, DISSEMINATED. (*See DISSEMINATED SCLEROSIS.*)

SCOLIOSIS. (*See SPINAL DISEASE AND DEFORMITY.*)

SCROTUM, SURGERY OF. (*See TESTIS, EPIDIDYMIS, AND SCROTUM, SURGERY OF.*)

SEA-SICKNESS.

Robert Hutchison, M.D., F.R.C.P.

This subject was considered in the ANNUAL for 1932 (p. 478), but two papers which have appeared on it since deserve mention. One of these, evidently based on a large practical experience, is by Surg.-Commander A. Vavasour Elder.¹ He is a supporter of the labyrinthine theory of etiology and thinks the fact that children in arms and old people are comparatively immune to the disorder is in favour of it. Against the ocular theory is the fact that totally blind persons suffer like others; of this he has met with four instances. He does not, however, exclude psychological factors. He thinks many of the popular remedies should be used with caution, and in the last two years has met with five cases of acute atropine or hyoscyne poisoning from their use, besides several cases of bromide and chloral over-dosing.

PROGNOSIS.—In uncomplicated cases the mortality is negligible, but prolonged retching may have a dangerous effect on patients suffering from other conditions, especially from hypertension. Elder has seen two cases of fatal ruptured aortic aneurysm and one of blindness from bilateral retinal hæmorrhage; also three of fatal hæmoptysis in chronic pulmonary tuberculosis. Valvular disease of the heart, especially aortic regurgitation, may end fatally, and in anginal subjects an attack may be precipitated. Herniæ are liable to strangulation and recent abdominal scars may break down. In cases of pregnancy there is a slight risk of miscarriage up to the end of the third month.

TREATMENT.—On this the author has little new to add to what was said on the subject in the ANNUAL last year. As regards diet, he consults the patient's inclinations, but rather forces fluids—especially water containing 5 gr. of **Bicarbonate of Soda** to the ounce.

There is no specific drug, and before administering any the rate and tension of the pulse should always be taken. **Bromides**, **Chloral**, or **Chloretone** may be tried singly or in combination till it is found which suits best. Five to ten grains of bicarbonate of soda should be given with each dose to counteract acidosis. Elder usually gives doses hourly for six doses before changing the mixture. Latterly he has given **Nitrites** (5 gr. sod. nitrite four-hourly or 1 min. of **Liq. Trinitrini** under the tongue at the same intervals). The liquor is applied with a dropper provided with a stiff nipple made from a 2-in. length of thick rubber tubing. Each dose should be followed by a draught of water to allay the burning feeling produced. The nitrite treatment should not be used if the tension is low, and in that event **Strychnine** ($\frac{1}{32}$ gr.) and **Atropine** ($\frac{1}{100}$ gr.), given hypodermically every six hours for three doses, should be tried.

Harold Hamilton² has made an extensive trial of **Sodium Amytal** and puts it first as a remedy, **Hyoscyne** second, and **Veronal** third. It is given in 3-gr. capsules with ice-water and repeated if necessary in two hours. The chief contra-indications are the chronic degenerative processes, especially in the elderly. It should not be given to patients known to be hyper-sensitive to barbituric acid derivatives.

REFERENCES.—¹*Jour. of the R.N.M.S.* 1931, July, 178; ²*Calif. and Western Med.* 1932, May, 317.

SEMINAL VESICLES, SURGERY OF. *Hamilton Bailey, F.R.C.S.*

There is probably no method of physical examination which is so dependent upon the clinician's physical attributes as that required in the detection of disease of the seminal vesicles. If the examiner is endowed with a long finger, these structures can be palpated readily per rectum. It seems probable, however, that a short index finger is not the chief reason why vesiculitis is overlooked; rather it is because so often no attempt is made to discover it.

Infective (Non-tuberculous) Vesiculitis.—Frequent nocturnal emissions, particularly if they are blood-stained, are more than suggestive of seminal vesiculitis. In acute cases fever is commonly slight, but as a rule there is backache and general malaise. Pain at the end of micturition is often complained of, and a swollen vesicle can partially obstruct the ureter and give rise to ureteric colic. It is particularly chronic seminal vesiculitis which is so commonly missed, for the symptoms are often obscure. Nearly always the gonococcus is the cause of the trouble, but W. S. Pugh¹ states that he has met many cases of vesiculitis due to coitus interruptus or ungratified sexual desire. It has been said that 75 per cent of cases of obscure backache in men are secondary to prostatitis and seminal vesiculitis. At any rate it is abundantly clear that *every male patient with unexplained backache should be examined per rectum*. Pugh considers that many of the cases of obscure low back pain which give rise to so much trouble in medico-legal circles, might be elucidated if more attention was focused upon the vesicles.

TREATMENT.—At the first treatment Pugh fills the bladder with a $\frac{1}{2}$ per cent **Mercurochrome** solution and then passes the largest sound possible. At the next sitting the bladder is filled and the vesicles are massaged in such a way that they will be emptied. **Diathermy** is useful.

Aston and Dumbauld² have found that **Vaso-puncture** and an instillation of a 5 per cent solution of **Argyrol** is very efficacious in the treatment of rebellious cases of vesiculitis, particularly those with joint complications. Under local anaesthesia the vas is displayed through a small incision, and a hypodermic needle is thrust into its lumen towards the vesicle; 6 to 10 c.c. of the solution are necessary to distend the sac, and the injection should be made very slowly. If the patient's previous condition permits, he can be allowed up immediately after the small wound has been sutured and protected with an anchor dressing.

Pugh, after an experience of 365 cases treated by vaso-puncture, states that 65 per cent are failures because in addition to vesiculitis there is perivesiculitis. When other means have failed, he recommends vasotomy, or more rarely vasectomy.

J. C. McCarthy³ has had a wide experience in **Catheterization of the Common Ejaculatory Ducts** with a special ejaculatory catheter-carrier fitted to his well-known posterior urethroscope. He finds this an excellent method of draining the vesicles in necessary cases, of investigating patency of the ducts, of instilling medicated fluids into the vesicles, and of introducing opaque media for vesiculography. With regard to the latter, E. G. Mark⁴ is convinced that **Vaso-puncture** and the injection of a 40 per cent solution of **Uroselectan** as a rule produces less trauma and discomfort to the patient than endoscopic procedures. Furthermore, in a large percentage of cases where vesiculography is most needed the verumontanum shows such pathological changes that catheterization of the common ejaculatory ducts is impossible.

That epididymitis is a common sequel to prostatectomy indicates the almost inevitable existence of primary vesiculitis (Kenneth Walker⁵).

A. C. Morson⁶ produces *sclerosis* of the vesicles by injecting 4 c.c. of a

10 per cent solution of carbolic acid down the vas in the course of the operation of vaso-ligature, preliminary to prostatectomy. This measure prevents the possibility of post-operative vesiculitis.

REFERENCES.—¹*Med. Jour. and Rec.* 1931, April 16, 383; ²*U. S. Nav. Med. Bull.* 1932, xxx, 40; ³*Jour. Amer. Med. Assoc.* 1932, Feb. 27, 687; ⁴*Radiology*, 1931, xvi, 933; *Jour. Orient. Med.* 1931, xiv, 55; *Illinois Med. Jour.* 1931, lx, 147; ⁵*Brit. Med. Jour.* 1932, July 30, 196; ⁶*Ibid.* Aug. 6, 253.

SEPTICÆMIA. (See STAPHYLOCOCCUS and STREPTOCOCCUS INFECTIONS.)

SERUM SICKNESS.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—I. M. Allen,¹ who reviews the literature, including an article by the abstracter (see MEDICAL ANNUAL, 1925, p. 397), records a personal case in a man of 22, who after prophylactic injection of 10 c.c. of antiscarlatinal serum developed *brachial neuritis* and *amyotrophy* chiefly affecting the fifth right cervical root but also involving in a minor degree the two sensory roots below that level. Allen classifies the neurological complications of serum sickness in four groups: (1) A radicular type resembling Erb-Duchenne paralysis of acute onset; (2) A neuritic type in which single nerve trunks are affected; (3) A polyneuritic type in which the symptoms are those of toxic polyneuritis; and (4) A cerebral type in which the symptoms and signs are probably due to cerebral oedema. The prognosis is usually good.

A. Gordon² reports three cases of *musculospiral paralysis* and one of *facial paralysis* following prophylactic injection of 250 to 500 units of scarlatinal antitoxin in children aged from 8 to 13 years. The musculospiral paralysis lasted from four to five weeks and the facial paralysis seven weeks. Gordon states that paralyses following prophylactic inoculation are of much shorter duration than those following therapeutic injection and are not accompanied by trophic disturbances such as wasting. In view of the rarity and transient character of the paralyses following immunization Gordon urges that the possibility of their occurrence should be no contra-indication to the use of serum prophylaxis.

R. Morichau-Beauchant³ records two cases of *cerebral embolism* in men aged 60 and 40, accompanied in the former by embolism of the right brachial artery, following prophylactic injection in the first case of 5 c.c., and in the second of 10 c.c., of antitetanic serum. Both patients developed hemiplegia a week after injection. No previous example of embolism in serum sickness has been reported, but numerous cases have been described of cardiac arrhythmia, tachycardia, and collapse in this condition.

PROPHYLAXIS.—Encouraged by the success obtained in the prophylaxis of certain infectious diseases, especially measles, by the use of **Convalescent Serum**, D. Pauzat and J. Lévy⁴ used this method for the prevention of serum sickness following injection of tetanus antitoxin. The serum was collected from patients who had had a severe attack of serum sickness from four to five days after the symptoms had subsided, and was kept in the ice-chest until it was needed, in seven to twenty days after it had been drawn off. Twenty patients, of whom 16 had never had serum before and 4 had had one or two previous injections, received 10 c.c. of convalescent serum at the same time as 10 c.c. of non-refined tetanus antitoxin, while 23 who were given tetanus antitoxin only served as controls. The results were as follows. Only one of those who had received convalescent serum developed serum sickness, namely a woman, aged 33, who had previously had numerous attacks of Quincke's oedema, whereas 16 of the 23 controls, none of whom had been previously injected,

had an attack of serum sickness. While the number of cases is too small to be absolutely conclusive, the authors regard their results as sufficiently encouraging to justify continuance of the method.

REFERENCES.—¹*Lancet*, 1931, ii, 1128; ²*Jour. Amer. Med. Assoc.* 1932, xcviii, 1625; ³*Bull. Soc. méd. Hôp. de Paris*, 1932, 635; ⁴*Gaz. hebdom. des Sci. méd. de Bordeaux*, 1932, 71.

SHOCK.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The administration of **Fluid**, combined with **Heat** and **Morphin**, is still the most potent method of dealing with shock. Experimental work in connection with the etiology continues to occupy attention, but no conclusive results have been obtained.

H. L. Wenger¹ says that the value of intravenous infusion of **Normal Saline** solution is not fully appreciated, because the quantity of fluid used is insufficient. When a patient has veins unsuitable for repeated punctures, a cannula is inserted into the incised vein and a continuous flow is maintained. In one case of intestinal obstruction, 3300 c.c. of saline was administered in twenty-four hours. In another case of peritonitis 4000 c.c. of normal saline was administered in two doses within forty-eight hours. The blood-pressure should be carefully watched and the injection should be discontinued when the patient begins to perspire or has lacrimation. Some of the patients had chills immediately after the infusion of the saline. Matas believes that a chill following this therapy is an indication of resistance and vitality. He found that a large percentage of cases having reactions recovered.

M. C. Rous² refers to the use of intravenous saline. He recommends an ingenious apparatus which overcomes some of the disadvantages of the more usual technique. A glass flask of 1000-c.c. capacity is fitted with a rubber cork perforated for a large and short glass tube and a thermometer. The flask is inverted and encased in a metal box with a glass panel in the door, through which the temperature is observed. There are two carbon filament lamps of 16 candle power, with an automatic switch in the lower part of the box, by which the heat is maintained.

Preparation of the Saline.—If rigors are to be avoided, attention to detail is essential, and the item of prime importance is that the fluid used shall have been slowly distilled not longer than three days before administration. The Mayo Clinic insists that the water must be triply-distilled from glass within this period of time. The salt and, if necessary, the glucose are added. It is unnecessary to emphasize the desirability of scrupulous asepsis and cleanliness. After mixing, the saline is placed in the 1000-c.c. flask, which is autoclaved after the mouth has been plugged with sterile cotton-wool and a piece of paper tied over this. Having been autoclaved, the flask is ready for use during the next three days; it is bacteriologically sterile, and can easily be transported from one home to another without fear of contamination provided that the cotton-wool plug is kept dry.

J. O. Polak, V. P. Mazzola, and L. Zweibel³ state: Three conditions which attend all operations in varying degrees are shock, dehydration, and acidosis. Of importance in the prevention and treatment of shock is the intravenous injection of a concentrated **Glucose Solution**. The authors have studied more than 200 cases of primary shock and shock and hæmorrhage. In all, a 50 per cent solution of glucose was given. Blood transfusion or any intravenous substitute used late in the development of shock is of no avail; it simply overloads a failing heart.

Unless the tired parturient woman is given rest, fluids, and carbohydrates she is a poor risk, as anæsthesia disturbs the balance in the constituents of

the protein radical which has already been disturbed by the pregnancy. Moreover, it produces acidosis as the result of insufficient oxidation of glucose. A dose of **Morphine** with or without scopolamine gives both general physical and uterine rest, and an intravenous injection of from 50 to 100 c.c. of a 50 per cent solution of glucose will completely change the patient's appearance, pulse, and systolic and pulse pressure.

In traumatic shock in which the blood-pressure falls very low, the use of from 50 to 100 c.c. of a 50 per cent solution of glucose will raise the pressure from 15 to 50 mm. within four or five minutes.

The authors draw the following conclusions: (1) Shock, dehydration, and acidosis are preventable in the majority of cases. (2) In shock, the plasma volume and cell volume must be restored. (3) This can be done by prompt direct transfusion or the intravenous injection of a hypertonic glucose solution. (4) The blood chemistry is only temporarily changed when relatively large quantities of concentrated glucose are used. The excess is spilled over into the urine. (5) Intravenous injections of hypertonic glucose definitely increase the blood-pressure, the pulse-pressure, and the circulating volume of blood.

REFERENCES.—¹*Amer. Jour. Surg.* 1931, Aug., 307; ²*Jour. Med. Assoc. S. Africa*, 1931, Sept. 12, 558; ³*Amer. Jour. Obst. and Gynecol.* 1931, xxii, 817 (abstr. in *Surg. Gynecol. and Obst.* 1932, April, 382).

SIALOGRAPHY.

Sir W. I. de C. Wheeler, F.R.C.S.I.

L. N. Pyrah and P. R. Allison¹ state that sialography has a limited field of action, but is useful in certain cases of salivary fistulæ. The parotid and submaxillary ducts are easily accessible, so the technique is not difficult. The

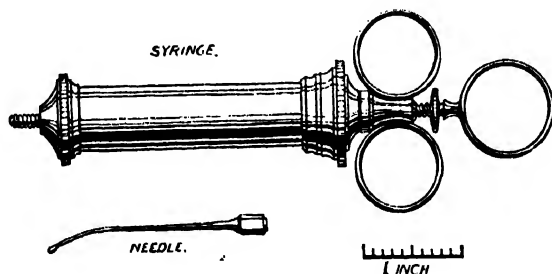


Fig. 62.—Syringe and needle used for sialography. (By kind permission of the 'British Medical Journal'.)

syringe is fitted with a modified lacrimal duct needle made of malleable silver (*Fig. 62*). The usual precautions of warming the syringe, needle, and lipidol are taken.

Technique of Injection.—

Parotid Gland.—The injection is performed with the patient sitting facing the surgeon, in a good light. In injecting the right Stenson's duct, the surgeon retracts the right cheek with his left thumb and forefinger, and looks for the orifice of the duct, which is situated opposite the crown of the second upper molar tooth. The opening in most people is slit-like: in some it is situated on a slight papillary elevation. If there is difficulty in finding the orifice, the gland may be made to secrete by giving the patient a slice of lemon to suck, or simple pressure upon the gland may expel a few drops of saliva and enable the opening to be found. The needle of the loaded syringe is brought up to the orifice of the duct and is steadied by the surgeon resting it upon his left thumb. It is slid into the duct for about an inch. The introduction of the needle causes a slight cutting pain, but not sufficiently intense to cause undue discomfort.

The injection is continued gently until the patient experiences a sensation of discomfort in the region of the parotid gland; this indicates that the finer ducts are filled with lipiodol. About $\frac{1}{2}$ to 1 c.c. is used. The needle is quickly but gently withdrawn, and the patient is immediately placed in the recumbent position on the X-ray table. Allison was able to inject his own Stenson's duct while standing in front of a mirror in a good light. In none of the authors' cases has any untoward complication occurred as a result of injection.

Submaxillary Gland.—The injection is performed in a similar manner. The patient sits with the mouth widely open and with the tongue pressed firmly upwards against the hard palate behind the upper incisor teeth. The orifices of Wharton's ducts are situated side by side near the frænum lingæ on a well-marked papilla. The needle is introduced as before, but the procedure usually presents more difficulty than in the case of the parotid duct.

X-ray Technique.—

Parotid Gland.—The patient lies on his side, and the radiographer places the head (as accurately as possible) in the lateral position, so that the two rami of the lower jaw are superimposed. The head is hyperextended so as to open up the space between the jaw and the vertebral column. The mouth is opened and is retained in this position by a cork, which is placed between the incisor teeth. With the patient in this position, the greater part of the shadow of the gland is in front of the shadow of the cervical vertebrae.

Submaxillary Gland.—A lateral radiogram is taken here. The patient's mouth is fully opened and the tongue is pressed upwards to the roof of the mouth. There is usually no shadow of bone overlying that of the gland, but in some cases the hyoid shadow may be superimposed.

Uses of Sialography.—

1. In some cases of chronic parotitis with subacute exacerbation, sialography reveals that one essential feature in the pathology of the disease is a dilatation of the ducts and of the alveoli.

2. A sialogram is of value in helping to decide whether a tumour in the neighbourhood of a salivary gland is derived from the gland tissue or from adjoining structures. In the former case the gland may be largely destroyed and there may be a considerable filling defect on the sialogram, while in the

latter case, even though the gland may be somewhat displaced, it will show normal filling.

3. Injection of lipiodol may be of assistance in the localization of calculi.

4. The precise position and track of a salivary fistula, more especially of the parotid gland, can be traced very easily by means of a sialogram.

R. T. Payne³ deals with the same subject. Four cases are described. In the first case it was possible to demonstrate that a parotid fistula

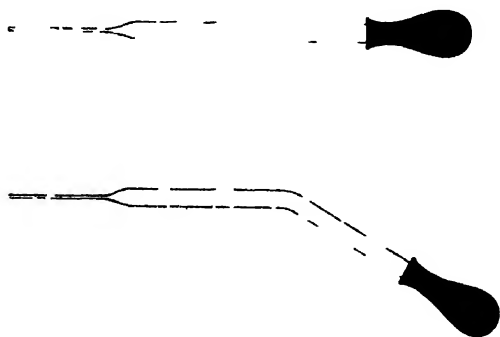


Fig. 63.—Type of syringe used for sialography by Payne.
(By kind permission of the 'British Journal of Surgery')

was strictly glandular in type. In the second case a pathological dilatation of the smaller ducts was shown following recurrent subacute parotitis. In the third case a dilatation in association with a calculus was shown. In the fourth the normality of the ducts was demonstrated in a case of Mikulicz's disease.

PLATE XXXVIII

SIALOGRAPHY

(R. T. PAYNE)



Fig. A. Sialogram of right parotid gland and duct.

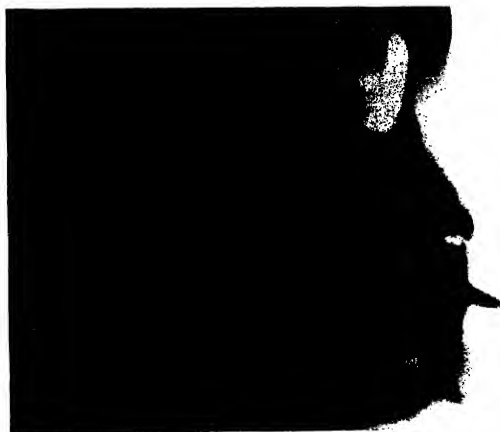


Fig. B. Sialogram of right parotid gland, showing minute spherical 'bronchiectatic' dilatations towards the terminations of the smaller ducts.

*By kind permission of the
'British Journal of Surgery'*

Payne's Technique.—Payne uses a rubber fountain-pen bulb attached to a short length of glass tubing, one end of which is drawn out to a fine point (Fig. 63). It is usually best to have a series of these of graduated sizes. He recommends the following technique:—

The Patient.—Before beginning the process the patient washes out the mouth with water or a mild antiseptic. The orifice of the duct is then sought in the region of the second upper molar tooth, and gentle massage of the parotid will usually render it patent. If necessary, one or two of the graduated cannulas may be passed into it to dilate it slightly. In cases where the duct orifice cannot be identified, or where it is impossible to pass even the finest cannula, the patient is given a piece of lemon to suck. After this has been done there should be no difficulty in localizing the orifice.

The Injection.—The patient thus prepared lies on his back on the X-ray table with his head turned towards the sound side. The apparatus is filled with lipiodol, and the cannula introduced into the duct for about half an inch. Once in position, the apparatus should be held extremely lightly in the hand. The bulb is now squeezed gently for about half a minute to force the lipiodol into the ducts. Screening is then carried out, and if the injection has been satisfactory, the main duct and the larger branches can be identified. If this is the case, the sialogram is taken (Plate XXXVIII). The injection process is then repeated, to be followed by a further screening and picture. As a rule $\frac{1}{2}$ to 1 c.c. of lipiodol is all that is required. The development of pain over the parotid region or swelling of the gland indicates that no more lipiodol should be injected. Should these symptoms develop, they can be quickly relieved by massage carried out to empty the gland or duct.

REFERENCES.—¹*Brit. Med. Jour.* 1931, ii, 1028; ²*Brit. Jour. Surg.* 1931, July, 142.

SKIN DISEASES. (See also DERMATITIS VENENATA; HERPES ZOSTER; LUPUS ERYTHEMATOSUS; NAILS, DISEASES OF; PEMPHIGUS; PSORIASIS.)

SKIN DISEASES, BISMUTH THERAPY IN.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Reference was made in a previous number of the MEDICAL ANNUAL (1931, p. 300), to the use of bismuth salts in the treatment of lupus erythematosus. R. M. B. McKenna¹ has carried out a series of investigations into the bacteriological power of colloidal bismuth oxychloride on a number of organisms *in vitro*. The organisms investigated were several strains of staphylococci and streptococci, *Microsporon andouini*, *B. tuberculosis*, etc. His experiments showed that all the commoner types of pathogenic bacteria, and also one type of pathogenic fungus (*Microsporon andouini*), were adversely influenced and could frequently be killed by low dilutions of colloidal bismuth oxychloride, solutions of which when used for a time period of a quarter of an hour appeared to possess satisfactory antiseptic properties in dilutions containing a bismuth equivalent of 1-500. The weaker organisms were killed in dilutions up to a bismuth equivalent of 1-4000, but further dilutions gave variable results. The presence of serum did not appear unduly to influence the action of bismuth. It was shown that the human strain of tubercle bacillus was more susceptible to bismuth than the bovine, and the growth of both strains was inhibited by dilutions of bismuth up to 1-8000. The human strain did not grow after exposure for half an hour to a concentration of 1-64,000 of bismuth.

These bacteriological findings corroborate the author's clinical experience. He has found a 10 per cent **Bismuth Oxychloride** ointment an efficient remedy in subacute impetigo, pustular folliculitis, and in some cases of sycosis. It is

most useful in cases of chancroid; he has seen cases respond rapidly which have failed to heal with mercurial ointments and lotions. He has found that cases of lupus vulgaris benefit considerably by injections of bismuth oxychloride, but does not claim any complete cures. He believes that there will be found increasing scope for the use of this metal in dermatology.

REFERENCE.—¹*Brit. Jour. Dermatol. and Syph.* 1931, Nov., 565.

SKIN, EPITHELIOMA OF: RADIUM TREATMENT.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

L. Arzt and H. Fuhs¹ report the results of cases of epithelioma of the skin treated at the Vienna Radium Station, either by radium alone or by radium in combination with surgical measures. The cases were treated between the years 1912 and 1925 and have all been observed for five years subsequent to treatment. Out of 404 cases, 347 were treated by radium alone, with no recurrence in 73 per cent of cases; 57 were treated with surgery and radium, with 74 per cent non-recurrence. The following is the regional distribution of cases. Treated by radium alone: upper lip (5 cases), 80 per cent well; lower lip (12 cases), 66 per cent well; trunk and extremities (9 cases), 55 per cent well; region of the eye (107 cases), 82 per cent well; ear (14 cases), no cases well; forehead (53 cases), 74 per cent well; nose (122 cases), 78 per cent well; cheek and chin (25 cases), 66 per cent well. Treated by surgery and radium: upper lip (6 cases), 83 per cent well; lower lip (9 cases), 55 per cent well; trunk and extremities (no cases); region of the eye (12 cases), 83 per cent well; ear (3 cases), 33 per cent well; forehead (2 cases), 100 per cent well; nose (18 cases), 83 per cent well; cheek and chin (7 cases), 58 per cent well.

There is a tendency to use radon seeds in the treatment of superficial epithelioma, instead of radium plaques. R. T. Brain,² A. Burrows,³ and A. C. Roxburgh⁴ all advocate this method. The radon seeds are buried around or beneath the growth in platinum needles of 0.5 or 0.6 mm. thickness or its gold equivalent: 1.1 to 1.5 millicuries to each square centimetre of growth is the dose recommended. The seeds are removed after one week. In this method all β radiation is for practical purposes cut out.

Roy Ward⁵ still considers that for small rodent ulcers an exposure to an unscreened full strength application is the method of choice. In both cases this refers only to superficial growths not more than 1 cm. thick, and the immediate results of both methods seem to be much the same. It is too early yet to judge the late results of the seed method, but the plaque method has given excellent results in small growths.

REFERENCES.—¹*Wien. klin. Woch.* 1932, Jan. 1, 15; ²*Brit. Jour. Dermatol. and Syph.* 1930, Nov., 525; ³*Med. Press and Circ.* 1932, Feb. 10, 117; ⁴*Practitioner*, 1932, March, 242; ⁵*Ibid.* 351.

SKIN, FUNGUS AFFECTIONS OF.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Cattle Ringworm in Man.—G. Ashton¹ has summarized some of the facts which came out in an investigation by the Ministry of Health into the question of cattle ringworm. Most of the infection is due to the ectothrix type of fungus, especially *T. album* and *T. discoides*. Bovine animals are most readily infected with ringworm, especially young stock animals. Calves are the chief sufferers, and the disease seems to be relatively rare in dairy animals. Dogs and horses are also susceptible. Goats and cats suffer more rarely; pigs and sheep hardly at all. In men the disease is commonest in farm labourers; those who handle calves are particularly liable to be infected. Cases derived from horses and mules were seen in men attached to mounted units and transport

services during the late war. The disease is usually limited to exposed parts; the hands, wrists, forearms, and upper arms are the parts most commonly affected, but it may spread to the head and neck. More rarely cases of wide extent are seen, and cases in which the beard, scalp, or nails are involved.

Prevention of infection can be largely secured by: (1) Issuing instructions to farm labourers and others as to the infectious nature of the disease; (2) The provision on the farm of suitable places for washing and disinfecting the hands of those who have been in contact with infected cattle; (3) Wearing a washable overall whilst handling infected cattle and a washable cap whilst milking; (4) Calling attention to the danger of dressing sores, etc., on infected cattle with the naked hands, and providing india-rubber gloves, which should always be worn for this purpose; (5) Cleansing and lime-washing all rubbing posts, stalls, railings, gate posts, etc., with which it is known that infected cattle have been in contact; (6) Preventing children kissing and fondling calves; (7) Ensuring the observance of Article 13 of the Public Health (Meat) Regulations 1924, which prohibits the 'blowing' or inflation with the human breath of carcasses of calves slaughtered for human consumption.

X-ray Treatment of Scalp Ringworm.—A very important article on the X-ray treatment of scalp ringworm is written by S. C. Shanks.² The author has been responsible for the treatment of cases in the London County Council's Goldie Leigh Hospital (until recently under the Metropolitan Asylums Board) under the direction of Dr. MacLeod as consulting dermatologist. He publishes the result of treatment in over 2400 cases dealt with during the last ten years. The value of reports on such a large number of cases, dealt with under ideal conditions (all the children being in-patients) and by the same team of workers, will be at once obvious.

The author describes the apparatus used in some detail, giving reasons for his preference for the transformer with single-valve rectifier over the coil apparatus originally employed. The Coolidge tube was used for all but the first 245 cases. Specially interesting is the description of a couch and restraining apparatus used for very young and restive children, which has enabled the author to treat a number of cases that would otherwise have been impossible. The Kienböck-Adamson method has been used throughout, and the author discusses the advantages of the use of electrical constants in dosage (MacKee's 'indirect technic') over the Sabouraud pastille method, though the latter is always used by him as a control. He stresses also the value of the 'biological test', especially when using new apparatus.

Of the 2400 cases, some 671 were of 3 years of age or under—cases that would usually be said to be too young for X-ray treatment. The incidence of the disease appears from the author's tables to be highest in children of 3 years of age, 381 cases being recorded; from this age to that of 8 years there is a gradual fall, and after this the fall is more rapid.

As regards results, 83 per cent had a normal defluvium; 9.5 per cent showed some under-exposure and 2.5 per cent some over-exposure (of these only 0.4 per cent developed some permanent alopecia of a very slight and local type); 4.3 per cent showed some septic infection after treatment.

The full paper deserves the careful study of all those who are engaged in the treatment of this condition.

Thallium Acetate in Ringworm of the Scalp.—J. T. Ingram³ discusses the vexed question of the safety of the use of thallium acetate in the treatment of scalp ringworm. He points out that, excluding deaths which have occurred from obvious overdosage, four fatal cases have been reported. In one of these the child was found to be suffering from active tuberculosis and syphilis; in the other three the patients were not given a single dose, as is the practice when

treating scalp ringworm, but a series of doses. He does not think that these cases are at all comparable to those under discussion. He thinks, however, that attention should be paid to the total dose administered as well as to the dose per body weight. He divides his cases into four groups as follows : (1) If the total dose is under 200 mgrm., treatment proceeds as in the case of ordinary out-patients ; (2) If the dose is between 200 and 250 mgrm., the cautious may treat the case in bed, but it is satisfactory to proceed as with cases in group 1, as long as the child is kept under observation ; (3) Between 250 and 300 mgrm. great caution is exercised and the case is treated in bed ; (4) More than 300 mgrm. is never administered.

As local ancillary treatment Ingram recommends that the whole scalp should be painted three times a day with 2 per cent **Tincture of Iodine**. This provides adequate anti-parasitic action, while at the same time a coarse desquamation of the scalp is effected, reaching its height towards the end of the third week. The scalp should not be washed during the first two weeks, but should be washed once or twice during the third week. The desquamation of the scalp brings away the infected hairs with it, and the whole procedure is effected with the minimum of trouble to patient and doctor. No ointment should be used.

Ringworm of the Feet.—

PROPHYLAXIS.—The spread of fungous infection of the toes among school and university students is a subject which is attracting a good deal of attention in America, and the prevalence of it has been demonstrated in many communications to the medical press. Though it is probably equally prevalent in this country, far less attention has been paid to this highly infective and troublesome complaint. Various methods have been suggested to prevent the spread of infection. In last year's **MEDICAL ANNUAL** (p. 487) we referred to the suggestion of W. L. Gould, who recommended 10 to 15 per cent **Sodium Thiosulphate** foot-baths. E. A. Osborne and B. S. Hitchcock⁴ have tried **Sodium Hypochlorite** for the same purpose. They find that most of the pathogenic fungi are killed after fifteen seconds' exposure to 0.15 per cent solution of this substance, but that a few require 0.5 per cent solution. They have tested the method practically in some of the high schools at Buffalo. Shallow rubber pans filled to the height of 2 in. with 0.5 per cent solution of sodium hypochlorite have been placed where the pupils have to walk in them between the shower-baths and changing-rooms. Since the introduction of this prophylactic measure they have failed to trace a single new case of the disease in the institutions concerned, although numerous ones have appeared from the surrounding towns. The authors claim that the method is cheap and clean, and believe it more uniform in its action than sodium thiosulphate, which may be split up by chlorine added to some municipal water supplies.

TREATMENT.—J. F. Schamberg, H. Brown, and M. J. Harkins⁵ have made a large number of investigations into the fungicidal properties of many substances. Although their investigations are still being pursued, they have up to the present found that **Iodine** is the most active fungicidal substance they have used. *Epidermophyton interdigitale* is killed in fifteen minutes in a dilution of 1–15,000. Next to this comes **Mercury Acetate Crystal Violet** in 25 per cent alcoholic and acetone solution, which kills on an average of about 1–20,000. Third in efficiency is **Mercury Acetate Fuchsin**. They have had considerable clinical success with the following ointment :—

Oil of Cloves	0.06 parts
Oil of Cinnamon	0.06 „
Iodine	0.03 „
White Petrolatum	30.00 „

or, if a more drying ointment is required :—

Oil of Cloves	0.06 parts
Oil of Cinnamon	0.06 "
Tincture of Iodine	2.10 "
Zinc Oxide	5.00 "
White Petrolatum	25.00 "

The oils are added because of their strong fungistatic power.

A. G. Goyld and E. K. Carter⁶ have compared the fungistatic properties of **Mercurochrome-220 Soluble** and **Liquor Hexylresorcinolis**. They find that the latter has about equal fungistatic properties with salicylic acid, both being active growth-restraining substances in approximately 1-30,000 solution. But mercurochrome-220 soluble, they find, is not a powerful fungistat; three common trichophytons of the toes and foot grew luxuriantly in the presence of a 1-600 solution.

Sensitization.—C. White and S. J. Taub⁷ suggest that the presence of a fungous infection, such as interdigital mycosis, may sensitize a patient's skin to other substances than the toxin of the fungus concerned. The question of non-specific sensitization of the skin is an intriguing subject, but one in which definite proof is difficult to obtain. The cases quoted by the authors suggest that sensitiveness to such substances as cotton-seed oil, oatmeal, buckwheat, silk, tomato, milk, and chocolate was produced as a result of a previous acute fungous infection, but it is questionable whether the means at present at our disposal are sufficient to enable us to prove the correctness or falsity of their view.

REFERENCES.—¹*Lancet*, 1932, i, 97; ²*Brit. Jour. Dermatol. and Syph.* 1931, Oct., 477; ³*Brit. Med. Jour.* 1932, i, 8; ⁴*Jour. Amer. Med. Assoc.* 1931, Aug. 15, 453; ⁵*Arch. of Dermatol. and Syph.* 1931, Dec., 1033; ⁶*Ibid.* 1932, Feb., 348; ⁷*Jour. Amer. Med. Assoc.* 1932, Feb. 13, 524.

SKIN, STAPHYLOCOCCAL INFECTIONS OF.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Bacteriophage Treatment.—Reference was made in the MEDICAL ANNUAL 1931 (p. 432) to the treatment of staphylococcal infections with specific bacteriophage. Bacteriophagia, according to Alderson, whose article was previously quoted, is a "dissolution of bacterial cells brought about by a filter-passing principle which multiplies at the expense of the attacked bacteria and is therefore capable of exerting its lytic action through an indefinite number of serial passages". A number of papers giving clinical results of treatment by bacteriophage have recently been published.

B. L. Kahn¹ gives details of a number of cases treated by him, and quotes a personal communication from Lloyd Arnold, indicating that those who use bacteriophage therapy are not dealing with one therapeutic factor only. Arnold states: "Bacteriophage, as used therapeutically, usually means a Berkefeld or similar filtrate of both cultures of bacteria which have been dissolved by a lytic principle. There is present in this material the peptone and meat extractives of the broth, the dissolved bacterial proteins (probably unchanged), and a transmissible lytic principle. The protein content of the material should be borne in mind by the physician when he uses these preparations. The therapeutic effect of bacteriophage filtrates is attributed to: (1) The protein of the dissolved bacteria, which is in the form of a very readily available antigen; (2) The transmissible lytic agent, which is capable of dissolving homologous bacteria; (3) Foreign protein shock when the material is injected; or (4) A combination of the foregoing. Whatever mechanism may be operative, it is known with certainty that, following the use of bacteriophage, the

opsonic index is greatly increased and that all the antibodies that can be produced by the heat-killed organisms are also produced by filtrates of bacteriophage-lysed cultures. Bacteriophage filtrates have been used most widely and with the greatest success in acute staphylococcus infections of various types". In Kahn's cases the majority of patients received 2 c.c. of staphylococcus bacteriophage every third day. To those who showed severe reaction only 1 c.c. was given. Local dressings of bacteriophage were also used. Only 20 cases were treated, and this series included 9 cases of acne vulgaris.

A. C. Cippollaro and A. E. Shaplar,² however, give a series of 108 cases, only 5 of which were acne vulgaris, the remainder being furunculosis, carbuncle, sycosis, and a few cases of abscess and folliculitis. The results obtained both by Kahn and Cippollaro and Shaplar give the impression that bacteriophage therapy as employed by them is not to be considered a specific remedy for these affections. Considerable improvement has followed in the majority of cases treated, but does not seem to differ much from the results of other forms of treatment. For instance, Cippollaro obtained marked improvement in only 6 out of 28 cases of sycosis vulgaris. If the treatment were really specific, one would hope for a considerably better result than this. Reported cures in cases of furunculosis—a notably capricious disease—leave one rather cold. It is clear that far more work requires to be done on this subject before any conclusions can be drawn as to its value.

REFERENCES.—¹*Arch. of Dermatol. and Syph.* 1931, Aug., 218; ²*Ibid.* 1932, Feb., 280.

SKIN, STREPTOCOCCAL INFECTIONS OF: ERYSIPELAS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

A. M. Memmersheimer¹ recommends the use of a **Mixed Streptococcus Vaccine** in the treatment of erysipelas. The vaccine is freshly made and contains at least twenty strains of pathogenic streptococci. It is made up to 85,000,000 per c.c. Intravenous injections are given every other day in rising doses of 0.2-0.3-0.4-0.5-0.6 c.c. Frequently a febrile reaction results, but other symptoms are usually absent. If too strong a reaction is given by the intravenous route, the vaccine can be given intramuscularly, beginning with 0.5 c.c. and rising to 0.75-1.0-1.25-1.5-2.0 c.c.

The author points out that the action of the vaccine in acute erysipelas is not so convincing because of the varying severity of the condition, but it is much more striking in chronic recurrent erysipelas. He has treated 16 of such cases (13 females and 3 males). The influence of the vaccine was extraordinarily striking. The symptoms usually disappeared after the first or second injection. Only in one case was there a recurrence after the course had been carried out. He recommends that two or three further injections should be given in these cases, two months after completion of the first course, to raise the antibody content of the organism.

J. A. E. Sayed² recommends the intradermic injection of **Sterile Milk** round the spreading edge of the erysipelas patch if it is not on the face. In facial erysipelas intramuscular injections of 10 c.c. were given in three cases, in all of which no further spread of the disease took place.

R. Suzuki³ states that in Japan **Chenopodium** is largely used in the treatment of erysipelas. The preparation used is an emulsion of ethereal oil of chenopodium with egg-yolk. Dressings of 8 per cent of this oil are applied to the affected area and covered with protective. The dressings are changed every two hours and occasionally ice is applied on top. When the temperature falls they require to be changed less frequently. When the skin is sensitive weaker suspensions can be employed and the dressing may be warm. The

emulsion was found to possess energetic bactericidal power, and the author thinks that the ethereal solution penetrates the epithelium and inhibits the development of the organisms.

REFERENCES.—¹*Munch. med. Woch.* 1931, Aug. 21, 1438; ²*Brit. Med. Jour.* 1932, 281; ³*Schweiz. med. Woch.* 1931, Dec. 26 (abstr. *Presse méd.* 1932, April 2, 79).

SKIN-GRAFTING.

Sir W. I. de C. Wheeler, F.R.C.S.I.

J. H. Woolsey¹ believes that more successful results are obtained when adequate attention is given to a most important detail—namely, the dressing. Pressure is valuable in holding the graft firmly against its bed. Thorough splinting of mobile areas, as in the region of joints, is essential. Adhesive tape, if used to strap the dressing in place, is made adherent close to the grafted area, thereby permitting a minimum of motion. Many well-known types of dressing are described, including the following:—

Vaseline gauze, consisting of strips of gauze impregnated with pure vaseline or, better still, with vaseline to which has been added a small amount of paraffin, provides a very satisfactory dressing if well strapped in position. This should be changed in approximately four days, as a considerable amount of tissue secretion accrues. This dressing is adaptable to all immobile areas.

The *sea sponge and synthetic (rubber) sponge dressings* are used chiefly in the skin-graft of full thickness for pressure purposes, and, while unnecessary in the skin-grafts of less than full thickness, they may be employed with value over other dressings for immobilization purposes. If the bandages are applied in the usual manner, which is estimated to be 5 to 10 mm. of mercury pressure, they do no harm and will help to keep the grafts firmly against their bed. This method is best carried out by the use of pervious material such as perforated cellophane next to the graft, covered by a few layers of gauze, then the sponge over this, bandaged into position. This type of dressing is adaptable to any area where bandaging to hold the sponge in place is practicable.

Certain *special pressure methods* which give complete immobilization for the free skin-grafts of less than full thickness were developed during the war period by Esser, of Holland, and by Gillies. They are applicable to areas irregular in shape, as between the fingers, the external ear, over surfaces that have movement, such as the eyelids, in the lining of inaccessible areas, such as the interior of the nose, mouth, anterior urethra, or external auditory canal, and about the mouth. In the latter situation there is not only movement, but there is also the menace of the buccal secretions and a soft area against which an ordinary dressing cannot be placed firmly. Dental compound is employed as a mould, for it is malleable with heat and can be fitted exactly to the area for skin-grafting. Over this mould or stent the skin-graft is draped, then inserted into the pocket to be grafted, and held so by a few interrupted, non-absorbable sutures running over the top of the mould from either side. Before taking the graft, if one wipes a thin coat of vaseline over the skin, sufficient to fill only the pores of the skin, the graft clings in a better manner to the mould.

The *implantation graft* is a very useful type and is accomplished as follows: millimetre-sized pieces of skin-grafts of less than full thickness are cut, and these pieces are pushed down into the granulation tissue of an ulcer instead of being placed on the surface. This ensures perfect and constant approximation of the graft to its bed, and as the islands of skin that arise coalesce, far earlier healing of the ulcer occurs. This method is especially applicable to leg ulcers in ambulatory patients, and provides a means of skin-grafting for patients in whom the usual surface measures are not over 25 per cent successful under similar ambulatory treatment.

Woolsey's conclusions are as follows: (1) The successful take of a skin-graft of less than full thickness is dependent upon the establishment of an adequate blood-supply. (2) Holding the graft so that such an adequate blood-supply may develop is a most important part of the procedure and is of sufficient importance to demand the care of the surgeon himself. (3) Various types of dressings are suggested, but they must measure up to certain requirements that will assure success. (4) *Constant and perfect approximation* of the skin-graft to its bed is the essential requirement.

E. N. MacDermott² discusses the implantation method of skin-grafting. The area from which the graft is to be taken is painted with tincture of iodine or methylated spirit. It is then infiltrated with 0.25 per cent novocain. The skin is held taut and a thin slice is cut as in Thiersch grafting. This is then minced into small pieces 2 or 3 mm. square. A round-bodied needle is grasped in an artery forceps by its sharp end. A seed is impaled on its free end and pushed into the granulations so that it almost disappears from sight. The quickest result was obtained when the seed was not quite buried. The seeds are sown over the whole surface about 0.5 cm. apart. The grafted area is covered with sterile vaseline and gauze and left undisturbed for four days. On the fourth day the dressing is changed and thereafter dressings wet with eusol are employed until healing is complete. Within five to ten days a slight hollow appears at the site of each seed, with bluish-grey epithelium in its centre.

There is only one condition necessary in the use of this method—namely, the presence of granulation tissue in the wound. Infection is of no moment.

REFERENCES.—¹*Calif. and Western Med.* 1932, May, 334; ²*Irish Jour. Med. Sci.* 1931, Nov., 613.

SKULL, FRACTURES OF. (See HEAD INJURIES.)

SLEEPING SICKNESS. (See TRYPANOSOMIASIS.)

SMALL-POX. (See also VACCINATION.) J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to official statistics¹ of the incidence, mortality, and case-fatality of small-pox throughout the world during the last few years, owing to the decrease in the number of vaccinations and revaccinations the incidence of small-pox in England and Wales keeps high, although the mortality is almost negligible. In every other country, on the other hand, there has been a remarkable decline as the result of the active enforcement of vaccination, particularly in those countries where small-pox had been rife, such as Soviet Russia, Poland, and Rumania. In Austria, Belgium, Bulgaria, Denmark, Esthonia, Latvia, and Norway, no case was reported in 1929 or 1930, while only one or two cases occurred in Germany, Finland, Italy, Holland, Sweden, and Switzerland in 1930. In Africa the disease is declining in the North with the progress of vaccination, and especially in Egypt, where the vaccination campaign is very active. In Western and Equatorial Africa, where variola major is the predominating form, no remarkable change has occurred, and in Eastern and Central Africa increase both of the benign and malignant types of small-pox still continues. In the Union of South Africa only the mild form of the disease is prevalent, but in the Northern provinces both forms coexist. British India, where 215,204 cases were notified in 1930 with a fatality of about 50 per cent, constitutes the chief centre of small-pox in Asia apart from China, from which no statistics have been returned. Australasia has been practically free from small-pox during the last two years. In Canada and the United States the incidence of a mild type of disease remains high and has even slowly

increased during the last five years. In Mexico, on the other hand, a virulent form is present. Little information is available as regards small-pox in Central and South America.

L. Camus² reports that three cases of small-pox, two of which were fatal, recently occurred at Tours, and two, which both recovered, at Montpellier. The source of infection was traced to Morocco, where the disease is prevalent in remote districts, though rare in large towns. A committee of the Académie de Médecine has expressed the opinion that responsible authorities should be reminded of the measure recommended in previous years, namely, isolation of patients and contacts, vaccination and revaccination of those exposed to the disease, and disinfection at the French frontier of all goods from an infected area.

L. Pickering-Pick³ states that during the last nine years small-pox has been prevalent throughout the West Riding of Yorkshire, which had hitherto been entirely free from the disease. It had, however, always been a trivial complaint, and no virulent case had been observed. He therefore doubts if the present administrative control is worth the trouble and expense involved. He proposes that isolation should only be used for variola major, and that inspection of contacts should no longer be carried out, but that a circular letter should be sent to each one advising vaccination and stating the probable date of onset of small-pox if infection has taken place. Notification should still continue, with the addition of particulars as to date of onset, date of appearance of rash, and the patient's temperature and general condition on the appearance of the rash. Each case should be seen by the Medical Officer of Health or his assistant, so that any cases of variola major should be isolated. Such a scheme would cause a great increase in the incidence of the disease, but would save a considerable sum of money and would make more beds available for the treatment of severe measles.

SYMPTOMS AND COMPLICATIONS.—J. P. Marsden and E. W. Hurst⁴ record 11 cases of *acute nervous symptoms* associated with small-pox in patients aged from 6 to 46 years. Seven of these were examples of acute perivascular myelinoclasia or acute disseminated encephalomyelitis. Four made a more or less complete recovery and three died. The necropsies on these cases showed lesions typical of acute perivascular myelinoclasia and indistinguishable from those of the post-vaccinal cases.

In a paper on *eye complications* in subtoxic small-pox C. R. M. Greenfield⁵ states that 218 (3·4 per cent) of 6233 cases of small-pox admitted to the London County Council River Hospitals during 1930 developed the following ocular complications, most of which occurred during the involution of the eruption. Conjunctivitis 170 cases, of which 138 were diffuse and 32 phlyctenular; corneal ulcer 23 cases; iritis and irido-cyclitis 5 cases; and diffuse interstitial keratitis 20 cases. Blepharitis and styes usually occurred at a later stage of the disease when boils were likely to develop.

A. T. W. Powell⁶ records a case of variola minor complicated by *appendicitis* due to threadworms. The complication developed in convalescence in a boy aged 13. Operation was performed and recovery was uneventful.

DIAGNOSIS.—H. D. Chalke⁷ records his observations on thirty-eight cases of lichen urticatus or papular urticaria in children aged from 2 months to 8 years seen in the Metropolitan Borough of Poplar during 1930 and 1931. As many of them were suspected to be small-pox by the medical attendant, Chalke points out the following differences: (1) If the rash is moderately profuse on the limbs and absent or sparse on the face, the evidence is against the disease being small-pox. (2) Whereas in lichen urticatus papules may be present on the upper and lower extremities at the same time, the lesions of small-pox are always at a later stage of development on the face and arms than on the legs.

(3) The papule of lichen appears to be *on* rather than *in* the skin, whereas the lesion of small-pox commences in the deeper layers. Although modified small-pox shows many superficial papules, some of them will always be deep, while in lichen urticatus all are superficial. (4) The small-pox lesion is always inflammatory, and passes through the stages of vesicle and pustule before desiccation takes place, while the lichen papule is usually the colour of the surrounding skin, and though often capped by a small vesicle or crust remains a papule, unless there is much scratching and consequent sepsis. (5) The discovery of one or two urticaria-like lesions is very valuable aid in the diagnosis of lichen urticatus. (6) In lichen urticatus there is a severe pruritus, which does not occur in small-pox.

REFERENCES.—¹*Monthly Epidem. Rep. Health Sect. League of Nat.* 1931, 385; ²*Bull. Acad. de Méd.* 1932, cvii, 139; ³*Public Health*, 1931, xliv, 285; ⁴*Brain*, 1932, lv, 181; ⁵*Ann. Rep. L.C.C. for 1930*, Vol. iv, Pt. iii, 174; ⁶*Lancet*, 1932, i, 341; ⁷*Brit. Med. Jour.* 1932, i, 7.

SPA TREATMENT. (See PHARMACOLOGY AND THERAPEUTICS).

SPINA BIFIDA.

John Fraser, Ch.M., F.R.C.S.Ed.

The more recent literature of this subject was reviewed in the MEDICAL ANNUAL of 1931 (p. 437), but reference may be made to a paper by W. T. Coughlin.¹ He reports a series of twelve cases operated on with a single death, and it is his custom to operate on all cases with the exception of those which suffer from vesical or rectal paralysis. Operation is advised as early as possible, and a period of three to seven days after birth is that most favoured.

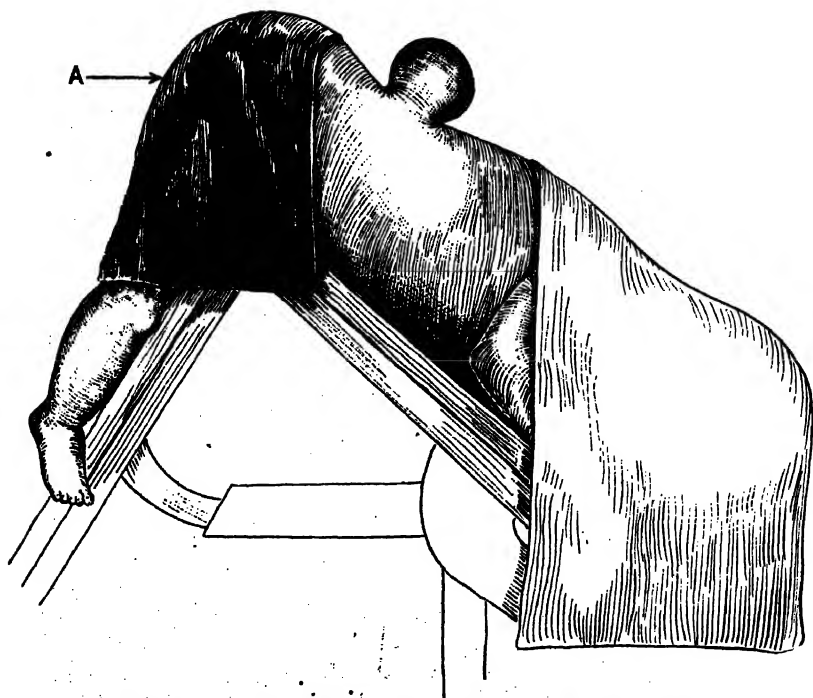


Fig. 64.—Operation for spina bifida, showing position during operation and for some days afterwards. A, Rubber sheet fastened to the skin with rubber cement. (By kind permission of 'Annals of Surgery'.)

PLATE XXXIX

TREATMENT OF POTT'S PARAPLEGIA

(G. R. GIRDLESTONE)

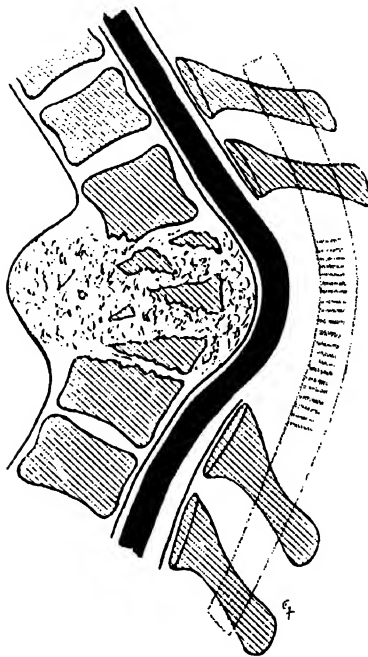


Fig. 1.—Bone grafting for paraplegia. Graft shown in red, with saw cuts to allow flexion.

*Plates XXXIX and XL by kind permission of the
'British Journal of Surgery'*

PLATE XI.

TREATMENT OF POTT'S PARAPLEGIA—*continued*

(G. R. GIBBLESTONE)

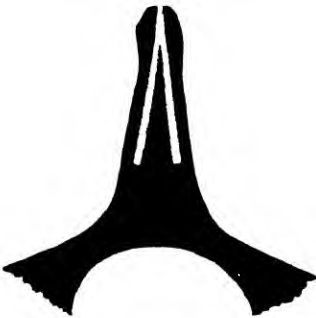


Fig. B.—Showing motor-saw cuts into a spinous process.

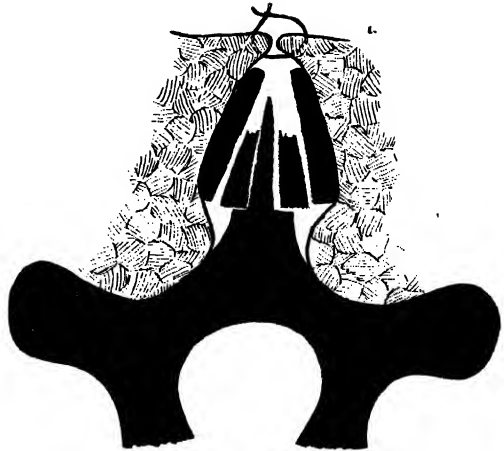


Fig. D.—Showing grafts as supported on spines above and below the area of the laminectomy.

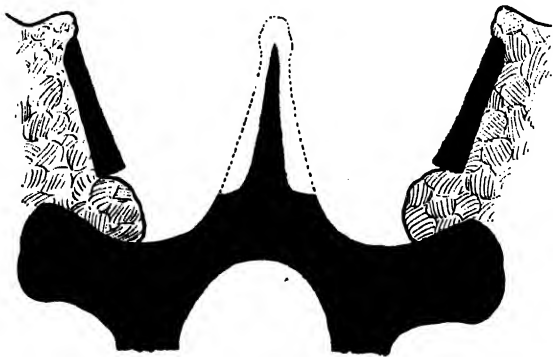


Fig. C.—State of affairs after reflection of osteoperiosteal flaps in the area of the laminectomy.

Early operation has the advantage of forestalling ulceration of the sac wall and leakage of contents, while operative shock is likely to be slight, and the inverted position which the author favours during operative and post-operative periods is one to which the infant is already accommodated (*Fig. 64*).

Reference is made to a question which so often puzzles the operator. If cord tissue exists in the sac wall, as it generally does in the case of the myelomeningocele, has a sterilization of the nerve tissue to be carried out so as to permit replacement of the cord within the vertebral lumen? Coughlin at one time employed cauterization, but he found that this was apt to be associated with a subsequent sloughing, so for the present he is satisfied with a process of pre-operative sterilization, applying 1 per cent **Mercurochrome** twice daily for several days prior to operation, and shaving off the thin superficial layer with a very sharp knife at the time of operation. When cord and nerves have been returned to the canal, and the redundant sac cut away, the sac is closed transversely with a continuous plain No. 00 catgut suture, serosa to serosa. No attempt is made to restore the bony canal, but a flap of lumbar fascia is used to repair the soft tissue defect. If there is difficulty in approximating the skin edges, a 'celsus' flap is slipped downwards from a higher level.

Coughlin is thoroughly optimistic as to operative mortality; he says, "by rigidly following the technique outlined, the operative mortality should be nil." The author's results may justify his optimism, and, if so, he is certainly more fortunate than the majority of surgeons.

REFERENCE.—*Ann. of Surg.* 1931, Dec., 982.

SPINAL DISEASE AND DEFORMITY.

E. W. Hey Groves, M.S., F.R.C.S.

Paraplegia caused by Pott's Disease or Scoliosis.—Fortunately the extreme degrees of tuberculous disease of the spine as regards deformity are now very rare, but unfortunately the even more serious effect upon the cord is still common enough to require anxious care in its treatment. The tendency among orthopaedic and sanatorium surgeons in recent years has been towards conservatism, but it is very much open to question whether this is justified, especially in the case of adults.

G. R. Girdlestone¹ puts forward a strong argument in favour of operative treatment of all cases of Pott's paraplegia in adults. It is usually possible to get a fairly accurate idea of the position and extent of the tuberculous disease and of the abscess so often associated with it in these cases. Such a case should be put on a suitable frame or plaster bed without delay, and then if the cord symptoms do not quickly improve, the decompression operation ought to be done. This will be of the nature of a **Laminectomy** or **Costo-transversectomy**, according to circumstances. Girdlestone thinks that even if the tuberculoma has arisen in front of the cord, yet the damage to the latter is caused by its being pressed backwards against the unyielding laminae. When the abscess has been evacuated or the tuberculous granulations scraped away, then the operation should be concluded by fitting in a strong bone-graft, so as to provide an efficient internal fixation. He relates 12 cases in which this combination of decompression and grafting has been done. Two cases died shortly after, and one was too recent to judge of the result. In the other 9 complete recovery had occurred in 5 and partial in 4. Where the X rays show a spherical or fusiform or prevertebral abscess, a costo-transversectomy is done to relieve the pressure of this, and then a fortnight later the graft is put in, usually doing a laminectomy at the same time (*Plate XXXIX*).

In regard to the technique of grafting, Girdlestone uses as large twin tibia grafts as can be obtained, placing them on each side of the spinous processes.

He describes and figures a method of splitting the spinous processes into three parts (*Plate XL*) which must be extremely difficult of execution. Personally we find the original suggestion of Albee of splitting the spine into two parts so difficult that we prefer to use a double graft and place one on each side of the raw spine. This technical point of the best way in which to fix spinal bone-grafts has been subject to many suggestions, some of which tend to simplification and others to complication. Thus S. A. Grantham² has devised a method which, apart from the necessity of having a number of specially shaped grooved osteotomes, is simplicity itself. He makes a small incision below the lowest spine of the area to be grafted and then drives in a grooved osteotome of suitable curve so as to cut off a series of spinal processes about five in number. The graft is then slid up the tunnel so made, by the help of a special guide retractor. No special after-treatment is used, neither plaster nor brace, as the designer of this method believes that the uncut fascia is

sufficient to keep the graft in place. He claims that immediate relief is afforded to patients and that the graft remains in place indefinitely. It is used for children as well as adults.

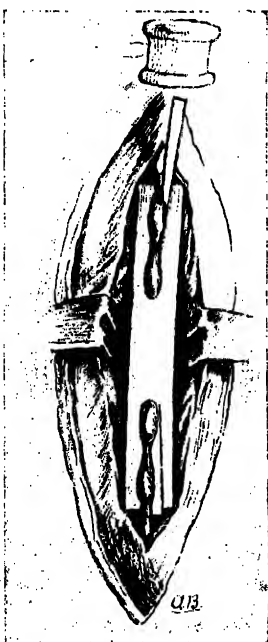


Fig. 65.—Gibson's method of spinal fusion.
Graft in place.

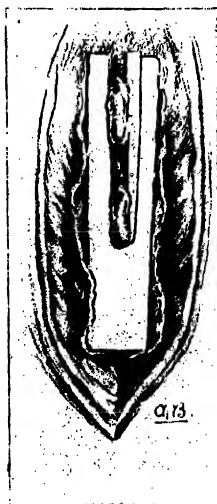


Fig. 66.—Gibson's method of spinal fusion.
A lumbo-sacral graft.

(Figs. 65, 66 by kind permission of 'Surgery, Gynecology and Obstetrics'.)

As a contrast to this simple method of tunnel grafting may be mentioned a highly complicated method by A. Gibson³ of cutting a flat graft so as to fit over and lock the spinous processes. It is in reality an ingenious method of obtaining a graft on either side of the spine, keeping the two halves of the graft in continuity (*Figs. 35, 36*). But it does not obtain the same massive effect as a double graft, because the whole structure has only the thickness of the front wall of the tibia, and it must require great skill and patience for its shaping and fixation.

Ever since the days of Pott it has been recognized that paraplegia is seldom the result of gross spinal deformity. It almost always results from the pressure of inflammatory products upon the cord. But that the exceptional condition

of pressure by gross bony deformity may occur, though very rarely, has been proved by the records of about 18 cases reported in the literature since 1913. H. R. Viets and M. H. Clifford⁴ report one such case and summarize the literature dealing with other cases. A boy of 18 had had poliomyelitis in infancy and was left with an extreme kypho-scoliosis. For nine months paraplegia slowly developed until it was practically complete. This was of the spastic type and the knee-jerks were present. As no improvement took place after treatment on a hyper-extension frame, an operation for decompression was done. The laminae of the 7th cervical to the 3rd dorsal vertebrae were removed, and as the cord still did not pulsate, the dura was opened up. The dura was left open without drainage. Six months later the patient could walk and swim, but the gait remained slightly ataxic and spastic. A review of the other 17 cases of similar nature shows that usually the age of the patient is about 16, the point of maximum deformity is in the mid-thoracic region, and the period which has elapsed between the onset of the deformity and that of the paraplegia twelve and a half years. In regard to treatment, about one-third were treated by hyperextension and the majority were improved or cured. Another third were treated by laminectomy, and these, too, made good recovery, but in much shorter time than those treated by conservative measures. The remaining third were treated by operation following unsuccessful hyper-extension.

Spondylolisthesis.—This disease or mal-development, which was first recognized in the eighteenth century, and given its present name by Kilian in 1854, was at first thought to be chiefly a disorder of women. This was before the days of X rays and when the condition was generally only recognized when it caused obstruction to labour. Now, since low back pain and 'sprained' back have received intensive study, it is abundantly clear that it affects men more often than women, and is probably of the nature of a congenital malformation.

Two recent papers, by N. Capener⁵ and F. A. Chandler⁶, deal with the many interesting details of the subject. In the first place it is of importance to notice that there are two types of this deformity. In one, which is much the commoner, the laminae of the 5th lumbar vertebrae are disunited from the centrum, and the latter slips forward. This is the true spondylolysis. In the other the last lumbar vertebra slips forward, but there is no breaking of the laminae. In nearly 50 per cent there is the associated

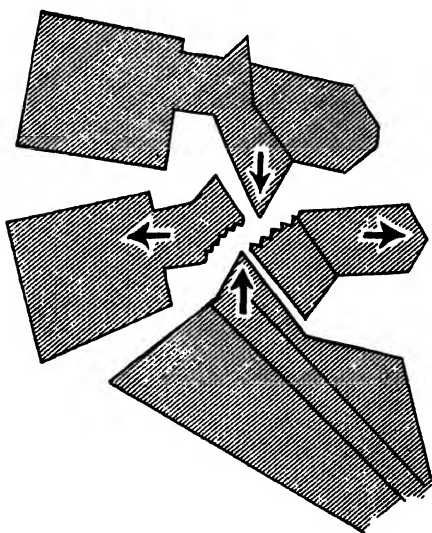


Fig. 67.—Diagrammatic lateral view of lower spine to show the influence of sacral and lumbar wedges upon the last lumbar vertebra. (Figs. 67-69 by kind permission of the 'British Journal of Surgery'.)

deformity of spina bifida. It is uncertain what influence trauma has in the causation or development. Obviously it cannot be the prime cause, but it may be a contributory factor in about one quarter of the cases. Capener makes an ingenious suggestion as to the wedge-like action of the sacral and

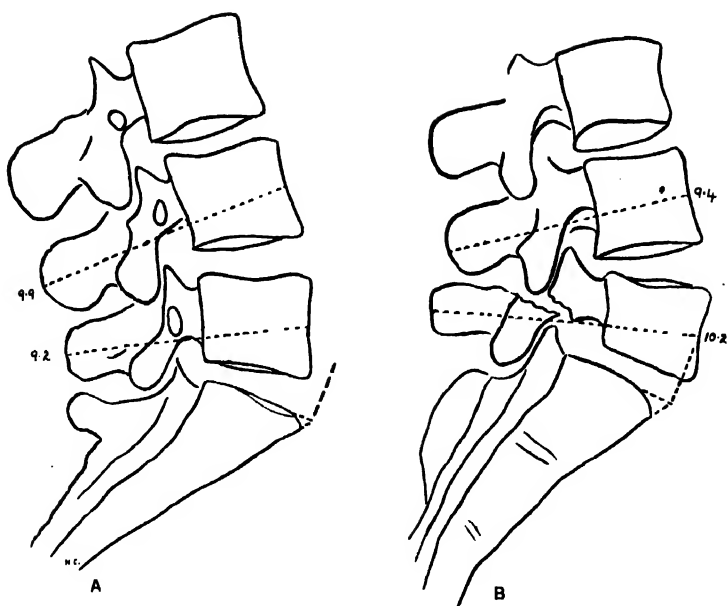


Fig. 68.—Two tests for early spondylolisthesis: (1) Comparison of antero-posterior diameters of last two lumbar vertebrae; and (2) Ullman's sign. In the latter a line is drawn at right angles to the upper border of the sacrum at its anterior edge; the 5th lumbar vertebra should lie entirely behind this line. A, Normal spine; B, Spondylolisthesis.

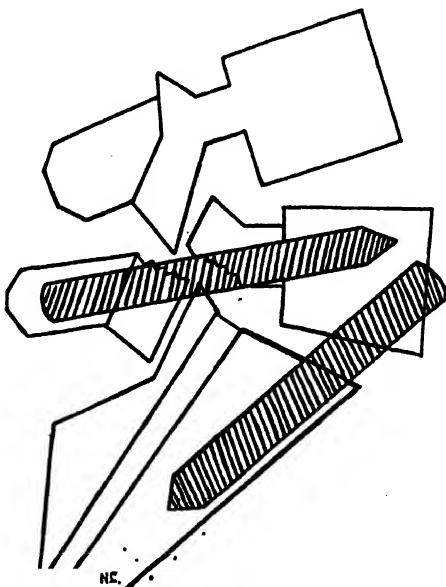


Fig. 69.—Theoretical alternatives to the posterior bone-graft operation for spondylolisthesis

lumbar bones in producing or increasing the deformity (*Fig. 67*). Although the deformity is of so gross a character, it is by no means easy to recognize or explain by means of the X rays. This is due to the fact that the lateral picture of the lumbo-sacral spine is so much obscured by the pelvic bones. Two criteria are of value. The first is that the antero-posterior thickness of the 5th lumbar vertebra is much increased as compared with that of the 4th; and the second is that the anterior margin of the 5th lumbar vertebra comes forward in front of an imaginary vertical line raised from in front of the sacrum (Ullman's sign). (*Fig. 68*.)

Capener is doubtful about operative treatment. Many cases have few or no symptoms. Others respond to rest, followed by a brace. The ordinary supra- or paraspinous graft is apt to be ineffective, because the broken-off 5th lumbar spine does not control the body of the vertebrae. He suggests two theoretical ideas for bone-grafting (*Fig. 69*), but considers that neither is practicable.

Chandler is in substantial agreement with Capener. He relates 18 cases in all of which there was solution of continuity of the 'laminae' of the 5th lumbar vertebra (*Fig. 70*). In no fewer than 12 of these the onset of symptoms was abrupt, usually after a definite and severe injury. In more than a third of his cases severe sciatica was the chief symptom. In half the cases the treatment was by open operation. This took the form of a long fusion of the vertebrae from the 3rd lumbar to the 2nd sacral inclusive, on the lines of Hibb's operation. The fusion of the intervertebral joints was reinforced by osteoperiosteal or other more massive grafts. One case died, but all the others did well and derived great benefit from the operation.

Congenital Scoliosis.—Scoliosis is sometimes of congenital origin, and it is then due to the fact that one or more of the vertebrae are incomplete, the bodies being only represented by 'half vertebrae'. Such a deformity will, of course, be permanent, and in adult life will lead to the usual lateral curvature, which has not so much rotary deviation as the ordinary scoliosis. It was first suggested by Codivilla in 1901 that this lateral deformity due to an unbalanced 'half vertebra' might be amenable to operative treatment. E. L. Compere⁷ has now actually carried out this suggestion in two cases, with encouraging results. Both were infants (13 and 16 months respectively). An incision was made along the spine over the point of greatest angulation; parts of the 11th and 12th ribs were removed and subsequently used as a spinal graft. The half bodies of the vertebrae were easily identified and were chiselled away. This allowed the lateral angulation of the spine to be partly corrected, and in this position a plaster cast was applied. The severity of this operation done in infancy makes it one which is not likely to be of general application, but it is interesting to note the possibility of direct operative treatment on some types of this very intractable deformity.

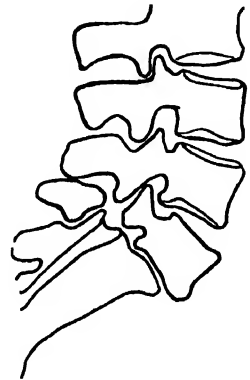


Fig. 70. Tracing of skiagraph of spondylolisthesis. (Redrawn from 'Surgery, Gynecology and Obstetrics'.)

REFERENCES.—¹*Brit. Jour. Surg.* 1931, July, 121; ²*Amer. Jour. Surg.* 1931, June, 448; ³*Surg. Gynecol. and Obst.* 1931, Sept., 365; ⁴*New Eng. Jour. Med.* 1932, Jan. 14, 55; ⁵*Brit. Jour. Surg.* 1932, Jan., 374; ⁶*Surg. Gynecol. and Obst.* 1931, Sept., 273; ⁷*Jour. Bone and Joint Surg.* 1932, July, 555.

SPIROCHÆTOSIS ICTEROHÆMORRHAGICA. (See JAUNDICE, INFECTION.)

SPLEEN, SURGICAL AFFECTIONS OF.

A. Rendle Short, M.D., F.R.C.S.

Rupture of the Spleen.—R. Morwa,¹ of the Hôpital Saint Louis, contributes an interesting study of the literature, embodying much French experience. In about 15 per cent cases of rupture of the spleen there is a 'period of silence', followed by sudden flooding of the peritoneum with blood; if the surgeon waits for the catastrophe, his death-rate will be high. The interval of silence may be twenty-four hours, or eighteen months; as a rule it is about two to five days. During this period a splenic hæmatoma may form. If operation is performed at this stage, the outlook is favourable. The signs during the silent period are often very slight; very suggestive, however, is a *late syncope*, coming on some minutes after the injury. There is generally also pain over the spleen, and occasionally a palpable swelling; there is a little peritoneal guarding; and a slight rise in temperature.

Mm. Oudard and Guichard,² writing on the same subject, describe cases to show that the blood collects during the silent period in the splenic pouch of peritoneum and later bursts free.

Splenomegaly.—A. J. Walton³ describes his experience of 42 splenectomies for enlarged spleen, and gives a brief account of the various causes of splenic derangement. It will be observed that 20 lived and 13 died.

WALTON'S SERIES OF 42 SPLENECTOMIES.

	TOTAL	MALES	FEMALES	LIVED	DIED
Rupture	5	4	1	2	3
Mobility .. .	1	—	1	1	—
Malaria	1	1	—	1	—
Splenic anæmia ..	13	5	8	11	2
Cirrhosis of liver ..	4	1	3	2	2
Pernicious anæmia ..	3	—	3	2	1
Acholic jaundice ..	4	1	3	4	—
Purpura	4 + 2	2 + 1	2 + 1	1 + 1	3 + 1
Lymphatic leukæmia ..	1	—	—	1	—
Myeloid leukæmia ..	1	—	1	1	—
Hodgkin	1	1	—	—	1
Lymphosarcomatosis ..	3	—	3	2	1
Hypercholesterinæmia ..	1	—	1	1	—
Totals	42	16	26	29	13

Splenectomy.—D. P. D. Wilkie⁴ says that in text-books of operative surgery no operation is described so inadequately as splenectomy. The key to the situation is the lienorenal ligament, which holds the spleen down, and is often thickened in splenomegaly. It must be divided before the splenic pedicle is dealt with. Begin by transfixing and ligaturing the gastrosplenic omentum; this may be very short at the upper pole, which may well be left till later. It is well to empty the stomach and leave the stomach tube *in situ* during the first part of the operation. Next, the spleen is drawn away from the diaphragm and chest wall to the right, and the lienorenal ligament brought to sight and divided, first the leaf of peritoneum, then the underlying areolar tissue (*Plates XLI, XLII*). This is the most important part of the operation. Now the spleen can be delivered into the abdominal wound. The upper part of the gastrosplenic omentum is displayed and the short vessels running from the stomach to the spleen are ligated and divided. The main splenic pedicle is raised on the fingers, and the splenic artery, which lies

PLATE XLI

SPLENECTOMY

(D. P. D. WILKIE)



Fig. A. Division of peritoneum of outer leaf of falciform ligament.

*Plates XLII XLIII by kind permission of the
'American Journal of Surgery.'*

uppermost, doubly tied (*Plate XLIII*) and cut. Wait a little to let the blood drain back from the spleen through the veins, then tie these, divide, and separate the spleen from the tail of the pancreas. There should be no bleeding.

REFERENCES.—¹*Rev. de Chir.* 1932, Feb., 97; ²*Presse méd.* 1932, April, 563; ³*Lancet*, 1931, ii, 945, 1004; ⁴*Amer. Jour. Surg.* 1931, Oct., 340.

SPONDYLOLISTHESIS. (*See SPINAL DISEASE AND DEFORMITY.*)

SPRUE.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

A high protein milk powder has been advocated in the treatment of sprue by N. H. Fairley,¹ which should be of value in the tropics where good quality meat is often unobtainable. The powder is specially prepared under the name of **Sprulac**,* and contains protein, fat, and carbohydrate in the proportions of 1.0, 0.3, and 1.3 respectively; it has been used successfully in the London Hospital for Tropical Diseases, with the addition of adequate quantities of **Liver Extract** to restore the blood deficiencies, in 10 sprue cases, with an average stay in hospital of fifty-four days. The monotony of the diet may be mitigated by the addition of egg custard and milk jelly.

REFERENCE.—¹*Trans. Roy. Soc. Trop. Med. and Hyg.* 1932, Jan. 30, 297.

STAPHYLOCOCCAL INFECTIONS. (*See also FACE; SKIN, STAPHYLOCOCCAL INFECTIONS OF.*)

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS AND COMPLICATIONS.—Considerable attention has recently been given in different countries to the question of *Staphylococcus septicæmia*. According to S. I. Medelkoff,¹ the staphylococcus is the most likely of all the pyogenic organisms to produce a prolonged condition of combined septicæmia and pyæmia which may last for months and even years and sometimes end in recovery. Two forms may be distinguished, namely, a frequent form characterized by an initial septicæmic stage followed by a long period marked by a succession of secondary localizations, and a rare form in which a first stage of common staphylococcal manifestations is succeeded by a stage of combined septicæmia and pyæmia. The prolonged course is possibly due to the relatively benign character of the organism, which is usually *Staphylococcus aureus*.

G. Marañon and Morros² state that staphylococcal septicæmia is relatively rare, especially when compared with streptococcal infection, forming only 6 per cent of all septicæmias. Metastases are frequently found in the thorax, kidneys, and perirenal tissue. The prognosis mainly depends on the patient's powers of resistance.

H. E. Roehm³ illustrates the rarity of *Staphylococcus albus* septicæmia by the fact that out of 57 examples of staphylococcus septicæmia on record 43 were due to *S. aureus*, 7 to *S. albus*, and 4 to *S. aureus* and *albus*, while in 3 the variety was not stated. The fatality-rate is 90 per cent in staphylococcus septicæmia due to carbuncle, 65 to 75 per cent in septicæmia due to other local infections of the skin, and 40 per cent in cases of osteomyelitis.

A. Petroff⁴ records 10 cases in patients aged from 12 to 42 years of *painful forms* of staphylococcal septicæmia. As regards their etiology, severe constitutional disturbance, and treatment, they do not differ from other forms of staphylococcal septicæmia, but they deserve special attention because their onset may simulate arthritis, neuritis, or myalgia. The pain in these cases appears to be due to infiltration of serum between the different muscular and musculotendinous layers, and irritation of the nerves. In most cases no pus is found, but only serous fluid is withdrawn on exploratory puncture.

B. Stich⁵ reports a case in a girl aged 16 closely resembling the type of *sub-acute bacterial endocarditis* caused by *Streptococcus viridans* but differing from it in that *Staphylococcus albus* was isolated from the blood. Although the patient often complained of pain in the joints and muscles, she never presented any visible inflammatory changes in the affected parts. Petechiæ did not appear until three days before death, which occurred six months after the onset. Post-mortem cultures of the pericardial fluid showed *Sta. albus*. The mitral valve was almost entirely destroyed by ulceration, and infarcts were found in the spleen, right lung, and left kidney.

P. Carnot⁶ reports two cases of *spondylitis* in men aged 47 and 40 respectively, one of whom was on the way to recovery and the other died, in whom staphylococcal infection of the dorsal or lumbar vertebræ with the formation of abscesses, radiating pain, and gibbosity closely resembled Pott's disease.

E. O. Jordan⁷ remarks that while nearly nine-tenths of the outbreaks of *food poisoning* in Great Britain are due to bacilli of the *Salmonella* group, in the United States food poisoning is not infrequently due to staphylococci without any admixture of paratyphoid bacilli. The staphylococcal type of food poisoning differs from that of the *Salmonella* group by its much shorter incubation period, symptoms rarely appearing later than four hours after swallowing the toxic substance, as compared with an incubation period of six to twenty hours in *Salmonella* poisoning. Although the symptoms may be alarmingly violent, no fatal case of staphylococcal food poisoning has yet been recorded, whereas the case-fatality in the *Salmonella* group is about 1 to 2 per cent.

TREATMENT.—P. N. Panton, F. C. O. Valentine, and V. W. Dix⁸ record thirteen cases of staphylococcal infections in patients aged from 10 to 64 years treated by **Staphylococcal Antitoxin**. They found that it was of value in cases of septicæmia and pyæmia, but the results were much less definite when the lesion was localized as in carbuncle.

REFERENCES.—¹*Thèse de Paris*, 1932, No. 42; ²*Arch. de Med. cir. y esp.* 1932, 189; ³*Arch. of Pediat.* 1932, 165; ⁴*Thèse de Paris*, 1932, No. 190; ⁵*Arch. of Internal Med.* 1932, xlix, 666; ⁶*Paris méd.* 1932, i, 513; ⁷*Jour. Amer. Med. Assoc.* 1931, xcvi, 1704; ⁸*Lancet*, 1931, ii, 1180.

STEATORRHEA, IDIOPATHIC.

Reginald Miller, M.D., F.R.C.P.

T. Izod Bennett, D. Hunter, and J. Vaughan¹ have published a long and most interesting paper under the title of "Idiopathic Steatorrhœa (Gee's Disease)". Although—indeed, it might almost be said because—it deals only with cases seen first in adolescent or adult life, it needs careful examination by those interested in pædiatrics. The syndrome on which they write has the features of cœliac disease, as is emphasized by the sub-title of the paper. In their series of 15 cases there were three features which were found in each case: (1) Steatorrhœa with an excess of split fat in the stools, with or without actual diarrhœa; (2) Disturbance of calcium metabolism; and (3) Changes in the bones, consisting of florid rickets, osteoporosis, or osteomalacia. As might be expected, tetany, either present or latent, was found in the majority of the cases. Anæmia was common but conformed to no constant type, hypochromic anæmia, hyperchromic megalocytic anæmia, and erythroblastic anæmia being found. Infantilism was present in some cases, and dilatation of the colon. These features are, as will be seen, in line with those usually described in cœliac disease. In addition the authors record two other features which have not been recognized as common in cœliac disease. One was the occurrence of skin lesions, mostly those of psoriasis; the other was the presence of opacities in the lens, only to be observed by the use of the slit-lamp and producing no deterioration of sight.

As will be seen, the symptoms of this series of cases all centre round the occurrence of steatorrhœa. Excessive loss of fat by the bowel is well known to produce disturbance of calcium metabolism by lowering the blood-calcium content, and consequently to predispose towards changes in the bones and tetany. Infantilism, anæmia, and dilatation of the colon are also recognized as results of steatorrhœa. Consequently, the authors are perfectly correct in giving their cases under the title of 'steatorrhœa'; and since they have excluded the presence of pancreatic disease and of sprue to account for that symptom, and have no other causative factor to bring forward in explanation of it, no one can quarrel with them for adopting the title of 'idiopathic steatorrhœa'. They have, however, gone further, and have, by giving the sub-title of 'Gee's disease', meant to lay stress on their view that the series of cases described can properly be included under the type known to pædiatric physicians as cœliac disease. They have avoided the term 'cœliac disease' in their title, although Gee's original paper was entitled "On the Cœliac Affection", and for this they have apparently two definite reasons; it is these that make the paper one of such great interest and value to pædiatricians. In the first place the authors wish to emphasize their view that the outlook in the cœliac disease of childhood is not necessarily so favourable as pædiatric authors are apt to state: on the contrary, in such of their cases as could be traced from early life, the results were very far from satisfactory. Secondly, they make the suggestion that cœliac disease may only become conspicuous after childhood is over, and seem to claim that it does not necessarily start only, as is generally held, in early years, but may originate in adult life. These two points need consideration in the light of the evidence brought forward in this paper.

1. Taking first the question as to the prognosis in cœliac disease, it is generally held that in cases arising in childhood the ultimate end-result is by no means bad under strict and lengthy treatment by means of a fat-free diet. Although some degree of stunting of the growth in height may remain, depending on the age at which treatment was begun, yet for the most part the symptoms of the disease abate and a fair degree of health is established before adult life is reached. What are we to say of the cases under discussion where symptoms were present from childhood and the results so unfavourable? It must be remembered that not one of the series was seen and investigated by the present authors until the years of childhood were over, and the only conclusion that the authors put forward is to the effect that the prognosis is evidently by no means as favourable as pædiatricians have stated. Yet, on perusing the very ample case reports provided in the paper, a most interesting point emerges—namely, that not one of the cases originating in childhood appears to have been correctly diagnosed or properly treated during the earlier years of its illness. In the absence of any direct statement to this effect by the authors, we must not, perhaps, draw this conclusion too definitely, but it certainly looks as though cœliac disease, arising but not properly treated in childhood, may continue to produce symptoms through into the years of adolescent and adult life. It is almost certain that some cases clear up spontaneously, and it is quite certain that with correct treatment cœliac children can grow up into symptom-free adults; and the evidence of the present paper does not negative the latter fact. It is, however, of great importance that we should realize the dangers of the non-recognition of cœliac disease in childhood, and we are grateful to the authors for publishing their most interesting examples of cases of this kind.

2. To pass to the further question—whether we are right in assuming that cœliac disease originates only during the years of childhood and not in later

life. There is, of course, no known reason why this disorder should not make its appearance in adult life: it is entirely a matter of clinical evidence, and it is in this matter of proof that so many difficulties arise. In the first place, the actual cause of coeliac disease is unknown, though we know several causes of steatorrhœa which are not the causes of coeliac disease. Similarly the cause of the 'idiopathic steatorrhœa' of the paper under discussion is unknown; but this does not, of course, make it coeliac disease. Secondly, there is the difficulty of dating the onset of the disorder, particularly in the milder cases where the symptoms make their appearance insidiously.

In the 15 cases of 'idiopathic steatorrhœa' there was in the great majority of instances a history of symptoms from infancy or childhood. These may be taken to be examples of ordinary coeliac disease, except for the fact, already mentioned, that they were neither recognized nor treated until they came under the authors' care in later years. The writers, in order to explain the sequence of events in one or two of their cases, put forward the suggestion that there may be a period of years between infancy and adult life during which the symptoms of coeliac disease may disappear and remain in abeyance. In one instance, for example, a male patient was said to have suffered from 'consumptive bowels' in infancy, and have had to wear napkins until the age of 7 years owing to diarrhœa. Some time after that he became perfectly well, and remained so until attacks of diarrhœa returned at the age of 27. At the age of 35 he came under the authors' care with steatorrhœa, tetany, and slight genu valgum, but without changes in the bones as examined radiologically. The amount of diarrhœa in a case of coeliac disease is so dependent on the amount of fat taken in the food that it is not impossible that some accidental circumstance or some experimentation on the part of the patient might abolish this symptom for some years. But if it were established that coeliac disease could remain in abeyance for a number of years, in the sense that fat-absorption became normal, it would, I think, be quite a new fact, and one of great interest.

Lastly, there are two cases bearing on the question whether coeliac disease can make its first appearance in adult life. The first of these was a married woman of 57 years when investigated by the authors. She had been well up to about the age of 53. She then had three attacks of colic with constipation. It was thought that she had gall-stones, but at operation none were found. Three weeks after operation severe diarrhœa started and continued for four years until she came under the authors' observation for steatorrhœa (with an excess of split fat in the stools), tetany, and osteomalacia. The second case was that of a man who at the age of 13 developed knock-knee after being apparently healthy at school. From 17 to 21 he was in indifferent health with lassitude, weakness, and anemia. From 21 to 40 he was healthy. At 40 he began to have attacks of flatulence and diarrhœa, but kept fairly well until the age of 54. Then he suffered again from diarrhœa, taken to be enteritis, and after six months of this he showed tetany. At 56 he came under the care of the authors for wasting, steatorrhœa, tetany, and osteomalacia. After a month he became mentally confused, and died in an attack of difficulty in breathing, possibly due to laryngeal tetany. Autopsy showed bronchopneumonia, severe parenchymatous degeneration of the kidneys, subacute ulcerative enteritis, and normal parathyroids. The only note on the condition of the pancreas is: "active gastric and pancreatic digestion and absorption of fat".

We must make every allowance for the possibility that if coeliac disease can start in adult life, its symptoms of onset might be very different from those seen in infancy; yet it cannot be said that either of these cases can be regarded

as convincing proof of the possibility under discussion. It may well be asked if convincing proof is possible, and it must be admitted that, with the cause of coeliac disease unknown, the proof of its presence can only be by the exclusion of other causes of steatorrhœa. In the establishment of a diagnosis of coeliac disease in a child there are many possibilities which have first to be excluded. Of these may be mentioned: overfeeding with fat; pancreatic insufficiency, in which in exceptional cases the faecal fat may be split; enteritis due to catarrhal rickets, tuberculosis, lamblia infection, chronic dysentery, ulcerative colitis, and sprue; and lastly lacteal obstruction from enlarged mesenteric glands of the type well authenticated by J. Ryle. It would seem as though, before it is admitted that coeliac disease can make its first appearance in adult life, some sort of similar sifting of the evidence will need to be undertaken in adult cases.

REFERENCE.—*Quart. Jour. Med.* 1932, N.S., i, 603.

STOMACH, CANCER OF.

A. Rendle Short, M.D., F.R.C.S.

J. S. Horsley¹ (Richmond, Va.) says that autopsy reports show that only about a quarter of the patients who die of this disease have any secondary growths, which suggests that many opportunities for doing a curative operation are missed. In Detroit less than 8 per cent of the total number of cases had a gastrectomy performed, so that only 1 patient in 12 was given a chance of a cure.

Grey Turner,² also, puts in a plea for more resort to surgery for this ailment. He was able to quote 5 cases surviving from four to eight years, though in the end all but one died of recurrence. He complains that doctors do not sufficiently educate their fingers, and often resort to X rays when a lump can be felt by those who know how to palpate an abdomen. In order to get good results several days ought to be devoted to preparation, including gastric lavage, and if the stomach is distended at operation, the anaesthetist should pass a large stomach tube. The author does partial gastrectomy by the Billroth I method, fixing the anastomosis to the liver. It is worth while in a difficult case to make a temporary gastrostomy also, for lavage purposes. If the growth is too extensive to allow of a cure, a partial gastrectomy may nevertheless be the best palliative; failing that, a gastrojejunostomy is worth while. It often gives great relief, but does not prolong life many months. Probably in these hopeless cases that is what the patient and his friends would wish.

D. C. Balfour,³ of the Mayo Clinic, reports a 5 per cent mortality for his last 200 cases of partial gastrectomy for cancer. One should not be deterred by finding large lymphatic glands along the lesser curvature, even if they cannot all be removed. They may not be cancerous, after all, as experience well shows. No fewer than 128 cases operated on at the Clinic between 1910 and 1920 were alive ten years or more afterwards.

Gavin Miller⁴ (Montreal) acted as assistant to Finsterer in Vienna, and gives his figures as follows:—

Mortality.—Simple resection: 211 cases, 6.1 per cent died. Complicated resection: 120 cases, 41 per cent died.

Late Results.—Simple resection: 116 cases recovered from operation; 81 per cent alive over 5 years. Complicated resection: 46 cases recovered from operation; 30.4 per cent alive over five years.

Primary carcinoma cases do better in the long run than ulcer-cancer. Finsterer much prefers to operate under a local and splanchnic anaesthesia or spinal anaesthesia, but allows gas-oxygen for nervous patients. He uses the Billroth II resection. If there is any tendency to lung complications, the

patient is made to breathe 5 per cent CO_2 as a routine for a few minutes every two hours, to expel bronchial mucus.

E. Gehrels⁵ points out that, as Anschutz, Finsterer, and others have shown, complicated cases or patients with large tumours, if they survive the big operation necessary, may do as well as simple cases in the long run: therefore even advanced cancers of the stomach ought to be explored.

REFERENCES.—¹*Amer. Jour. Surg.* 1931, Oct., 264; ²*Glasgow Med. Jour.* 1931, Sept., 137; ³*Surg. Gynecol. and Obst.* 1932, Feb., 312; ⁴*Canad. Med. Assoc. Jour.* 1932, Feb., 164; ⁵*Calif. and Western Med.* 1931, Oct., 284.

STOMACH, MISCELLANEOUS SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

Foreign Bodies in the Stomach.—J. E. Cannady¹ (Charleston) was moved to write on this subject by having under his care a young woman, sane but of a shy and solitary disposition, who made a habit of swallowing metal articles. At three operations well over three hundred small objects were removed, including 203 wire nails, 59 screws, 13 hairpins, 5 stove bolts, and 2 metal book-clips. They had done her no great harm, except that at the first operation it was found that a nail had perforated the cæcum and caused a localized peritonitis. He has marvellous tales to tell of 'bezoars', as bodies formed in the stomach from hair and other substances are called, and how in the Middle Ages they were regarded as priceless medicine. [We have seen a case in which a girl after a quarrel swallowed the entire contents of her sister's dressing-table, which in those days included numerous hairpins. These were mostly passed per rectum, but several of them perforated the bowel and formed abscesses which had to be opened.—A. R. S.]

Follicular Gastritis.—R. R. Fitzgerald² (Montreal) describes 9 cases under this title with symptoms like those of chronic ulcer, but with no ulcer found at operation. The microscopic appearance of the mucosa is characteristic, showing follicles with germinal centres. **Gastrectomy** usually gives cure or relief.

Hour-glass Stomach.—R. P. Rowlands³ gives a description of the first and the last of his cases of this disease, the one being treated by gastro-gastrostomy and Finney's pyloroplasty, and the other by partial gastrectomy. He points out that it is due to a peculiar and very chronic kind of gastric ulcer, almost entirely confined to women. There may or may not be pyloric obstruction as well. **Gastro-gastrostomy** is usually the best operation, provided the opening is made large enough; it should be combined with Finney's operation if the pylorus is narrowed. Partial gastrectomy is necessary if there is a large unhealed gastric ulcer. He has operated on over 60 cases with only 2 deaths. The end-results are very satisfactory.

Gastric Photography.—Those interested may be referred to articles by Stanley Wyard,⁴ C. A. Pannett and D. Levi,⁵ and D. Levi and H. C. Gage.⁶ At present the results are not strikingly valuable.

Barium Skiagraphy in Gastric Diagnosis.—Several papers have appeared calling attention to the value of what may be called the 'skeleton barium meal' for purposes of studying the gastric mucosa, by I. D. Overend,⁷ J. O'Sullivan,⁸ and R. A. Gutmann and Nemours-Auguste.⁹ The barium mixture is made up with some adhesive substance; Overend recommends 10 oz. of barium sulphate, 50 gr. of tragacanth powder, and 20 oz. of chloroform water. Enough is given to outline the whole stomach (*Plate XLIV*). The abdomen is watched and palpated with the patient lying supine, while the mixture is sipped, and the barium spread out over the folds of the mucosa by the examiner's fingers. In gastritis the folds are thickened and stiff, with irregular patterns. Ulcers

PLATE XLIV

BARIUM SKIAGRAPHY IN GASTRIC DIAGNOSIS

(J. O'SULLIVAN)



Relief picture of the gastric mucosa. Observe the radiation of the mucosal folds into the pyloric sphincter which is contracted. The round fleck in this region must not be mistaken for an ulcer.

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show up well. The method does not work well if the stomach is full of fluid or mucus.

Gastrostomy.—E. Prud'homme,¹⁰ of the Hotel-Dieu, Montreal, writes in favour of what he calls the 'gooseneck' method of operating, introduced by Quick and Martin, described in the MEDICAL ANNUAL for 1929 (p. 449). It has the great advantage of not closing if the tube is left out for a time.

REFERENCES.—¹*Ann. of Surg.* 1931, Aug., 218; ²*Brit. Jour. Surg.* 1931, July, 25; ³*Brit. Med. Jour.* 1931, ii, 50; ⁴*Lancet*, 1931, ii, 177; ⁵*Ibid.*, 174; ⁶*Brit. Jour. Radiol.* 1932, Feb., 107; ⁷*Brit. Med. Jour.* 1931, ii, 938; ⁸*Brit. Jour. Radiol.* 1932, Feb., 98; ⁹*Presse méd.* 1031, Nov., 1621; ¹⁰*Jour. de l'Hôtel-Dieu de Montreal*, 1932, April, 103.

STOMACH, ULCER OF. (See GASTRIC AND DUODENAL ULCER.)

STREPTOCOCCUS INFECTIONS. (See also FOOD AND THE PUBLIC HEALTH; SKIN, STREPTOCOCCAL INFECTIONS OF.)

J. D. Rolleston, M.D., F.R.C.P.

BACTERIOLOGY.—C. C. Okell¹ in his Milroy Lectures points out that a large number of hæmolytic streptococci from the most diverse sources in human disease and also from apparently normal persons are essentially similar, having the same general morphological and biochemical properties. Three properties are characteristic of the pathogenicity of the hæmolytic streptococci—namely: (1) An erythrogenic or rash-producing toxin, for which a neutralizing agent is available, in the form of scarlatinal antitoxin; (2) A pyogenic property, for which there is no antibody; and (3) An invasive property which may or may not be linked with (2), and for which there is no antibody available. These three elements vary in intensity in different cases. As the strength of the host's defence and the site of the invasion also differ, the forms of human streptococcal disease are liable to great variation. The streptococci occurring in scarlet fever at the present day are much less active in their pyogenic and invasive than in their toxigenic properties, but their pyogenic and invasive properties are manifested in complications, which range from local suppurations, which are common, to septicæmia, which is comparatively rare.

SYMPTOMS AND COMPLICATIONS.—I. Pilot and D. J. Davis² state that *sporadic sore throat* is most often due to hæmolytic streptococci, which in 10 per cent of the cases correspond in their cultural features to the *Streptococcus epidemicus* of epidemic sore throat. The usual form of sore throat due to *Str. epidemicus* is sporadic, while the epidemic type is unusual, and requires the development of streptococcus mastitis in a cow, whose milk becomes the source of the epidemic. *Str. epidemicus* carriers are probably the cause of direct transmission of sore throat. Clinically, sporadic sore throat due to *Str. epidemicus* varies from very mild to severe types. In tonsillectomized patients the symptoms are those of an infection of the upper respiratory tract resembling influenza. Immediate complications may arise in the form of otitis media, mastoiditis, or cervical adenitis, while sequelæ, such as acute polyarthritis, endocarditis, glomerulonephritis, and erythema nodosum may develop from ten to thirty or more days after the onset.

In view of the high fatality of *streptococcal septicæmia* it is noteworthy that a number of recoveries therefrom have recently been reported. Of two cases recorded by R. E. Smith³ of streptococcal septicæmia complicating epidemic influenza, one in a boy of 15½ recovered, while the other in a boy of 14½ died. C. E. Haines⁴ reports a case of recovery from generalized streptococcus infection in a male infant of 6 months with *Streptococcus hæmolyticus* peritonitis and epididymitis. Recovery followed laparotomy, but was delayed by the occurrence of empyema. Recovery from *Streptococcus viridans* septicæmia secondary to tonsillitis in the mother of a family in which the other four

members also had attacks of sore throat, is reported by H. Woltring and J. G. G. Borst.⁵ Unlike the others, who made a rapid recovery, the mother remained seriously ill after the throat symptoms had subsided, but finally made a complete recovery.

E. Appelbaum,⁶ who reports three personal cases, states that examples of recovery from *streptococcal meningitis* are exceedingly few, only 43 having previously been recorded. In most cases the source of infection was otitis media, often in combination with mastoiditis. His first case occurred in a boy, age 8 years, in whom meningitis followed tonsillectomy and was probably of embolic origin. Treatment consisted in **Lumbar Puncture** and administration of **Antistreptococcal Serum**. The second case occurred in a girl, age 8, who developed otitis media a week after influenza. Recovery in this case also took place under lumbar puncture. The third case was that of a boy of 15, in whom the meningitis was probably of tonsillar origin. Recovery followed two intraspinal injections of antistreptococcal serum.

REFERENCES.—¹*Lancet*, 1932, i, 761, 815, 867; ²*Jour. Amer. Med. Assoc.* 1931, xevii, 1691; ³*Lancet*, 1932, i, 1303; ⁴*Jour. Amer. Med. Assoc.* 1931, xevii, 610; ⁵*Nederl. Tijds. v. Geneesk.* 1932, 1956; ⁶*Jour. Amer. Med. Assoc.* 1932, xeviii, 1253.

SUBDURAL HÆMATOMA, CHRONIC. (See also HEAD INJURIES.)

Macdonald Critchley, M.D., F.R.C.P.

Experience teaches that one of the most difficult to diagnose of neurological maladies is chronic subdural hæmatoma. Up to a few years ago it was regarded as a great rarity, barely capable of recognition during life, and peculiar to the insane. Under the title of 'pachymeningitis hæmorrhagica interna (of Virchow)', it was chiefly known as a curiosity of the pathological museum. Recent studies, dating particularly from the work of W. Trotter¹ and of T. J. Putnam and H. Cushing,² have drawn attention to its existence as a, not very infrequent sequel of head injury, liable to appear in both sane and insane, and capable of diagnosis during life. Within the past two years, interesting contributions to the clinical and etiological aspects have been made by J. P. Martin,³ W. J. Gardner,⁴ and by P. van Gehuchten and P. Martin.⁵

Chronic subdural hæmatoma may develop at any age, from birth onwards. It is commoner, however, in the elderly or aged. Chronic alcoholism is frequently cited as a predisposing factor. The most important etiological factor is head injury; this may take the form of a birth trauma, or of an accident occurring in adult life. In many instances the force of the injury is slight or even trivial; this is particularly so in the aged, and one may broadly lay it down that the older the patient, the slighter the causative injury. In a few cases no history of trauma can be traced, probably testifying to the triviality of the blow. In one case at least, heading a ball during football matches has constituted the only traumatological feature. In infants scurvy may constitute an important etiological factor, 7 examples of which are quoted by B. B. Gilman and R. C. Tauzer.⁶

The clinical picture is characterized first by a period of latency between the accident and the onset of symptoms. In cases of severe injuries this interval may be short, and occasionally absent altogether. With slighter injuries a latent period lasting three or four weeks may be present, or even, as in the case of aged subjects, as many months. Symptoms directly referable to the hæmatoma are vague and usually most difficult to evaluate. The most important consist in headache, progressive muscular enfeeblement, drowsiness, psychical changes, and, later, incontinence. Martin has emphasized the striking variability of the signs and symptoms, which fluctuate from day to day and may even alter profoundly in the course of twenty-four hours.

The headache may be accompanied by vomiting; drowsiness is striking, but is often associated with a peculiar motor restlessness almost choreiform in appearance. Convulsions have been recorded. Mental changes are the most characteristic, and indeed are very rarely absent. They comprise a slowly progressive dementia with confusion, defective memory, going on to gross disorientation and lack of contact with the environment. The patient may become unable to feed or attend to himself, and incontinence soon develops. The muscular weakness is difficult to understand; the patient on examination in bed may seem to possess a moderate degree of physical strength, but when told to stand and walk, or to perform some activity, such a failure is witnessed as to suggest the diagnosis of an apraxia or an astasia-abasia. Physical examination may reveal but slight abnormality. The patient's defective co-operation or even resistance will complicate the investigation, but a few neurological abnormalities may be present. Exaggeration of the tendon-jerks and Babinski responses may be demonstrable; no gross motor or sensory loss is found as a rule, but at times a grasping reflex may be noticeable on one or both sides, together with an exaggeration of Mayer's finger-thumb sign. Papilloedema is sometimes found, but its absence should not be argued against the diagnosis. An important sign consists in severe local tenderness on percussing the skull. At times abnormal neurological signs of a hemiplegic distribution are found, but great caution must be exercised before accepting these as of lateralizing value, for it is notorious that the lesion often lies on the side opposite to that suggested. The pulse-rate may be normal or slightly slowed; slight irregular fever is at times observed; the respirations may be noisy, laboured, or irregular.

The effect of the hæmatoma is to compress the homolateral ventricle and to push the brain as a whole towards the opposite side. Ventriculography, therefore, affords information helpful in diagnosis. In very young subjects, the cranial contours may be much distorted, giving rise to an appearance of a unilateral or asymmetrical hydrocephalus.

Lumbar puncture rarely throws light upon the diagnosis. No coloration of the fluid occurs unless the hæmatoma happens to have ruptured into the subarachnoid space. Sometimes a rather high protein content is found.

Morbid anatomical observations show that the hæmatoma consists of a large mass, situate at times between the cranial and cerebral layers of the dura mater, but more often between the dura and the pia-arachnoid. The mass may attain such bulk as to measure two or more inches in thickness and to spread over the whole of the convex surface of the hemisphere (*Plate XLV, A*). The outer wall is thick and adherent to the inner aspect of the dura; it resembles a very vascular layer of granulation tissue. The inner wall is thinner, less vascular, and is not adherent to the pia-arachnoid. In very long-standing cases—as in the reviewer's case, and also in one recorded by R. Goldbahn⁷—the walls of the hæmatoma may become calcified or even ossified, and are visible in X-ray pictures of the skull (*Plate XLVI*). There is a good deal of variability in the contents of a hæmatoma—from a straw-coloured fluid to a firm currant-jelly-like or brownish clot (*Plate XLV, B*).

A certain amount of mystery surrounds the mechanism by which the hæmatoma forms and gradually increases. It is not easy to visualize a type of hæmorrhage which will steadily proceed over the course of weeks; nor is the hypothesis of a constant or intermittent oozing from a vascular membrane altogether convincing. W. J. Gardner has recently favoured the factor of osmosis as the possible cause of the increasing size of the hæmatoma. The author points out the absence of any lymphatic drainage from the subdural space, and suggests that osmosis between the cerebrospinal fluid and the fluid

within the original clot takes place through the neo-membrane formed by the wall of the cyst and arachnoid. P. van Gehuchten and P. Martin favour the older views as to the mechanism of the increase in the size of the cyst; they point out that within the outer wall are often present large sanguineous lakes. These may rupture, causing blood to infiltrate the walls; in places, too, they may burst into the cyst itself, thus swelling its volume.

The diagnosis can rarely be established at the bedside, though in long-standing cases, skiagraphy of the skull may reveal a typical calcified wall. Ventriculography, or, better, encephalography, might also help. In suspected cases the best plan is to make bilateral trephine openings; a bluish and bulging appearance of the dura is suggestive of an underlying hæmatoma. If such is found, it should be evacuated and washed out. A wide removal of bone is often advised lest a reactionary cerebral oedema follow and produce alarming symptoms. W. H. Fleming and O. W. Jones,⁸ however, favour the slighter operation of trephination and irrigation, postponing the turning-down of a bone-flap for some later occasion. The possibility of a similar hæmatoma over the opposite hemisphere should be kept in mind, and exploration carried out. The outlook is usually very favourable after evacuation, but at times, particularly perhaps in old people, a severe psychosis may return after a temporary improvement: the origin of this probably lies in the widespread molecular damage of traumatic nature rather than in a post-operative cerebral oedema.

REFERENCES.—¹*Choyce's System of Surgery*, 1914, iii; ²*Arch. of Surg.* 1925, xi, 329; ³*Proc. Roy. Soc. Med. (Neurol. Sect.)*, 1931, March, 585; ⁴*Arch. of Neurol. and Psychiat.* 1932, xxvii, 847; ⁵*Rev. neurol.* 1932, 39, ii, 178; ⁶*Jour. Amer. Med. Assoc.* 1932, xcix, 989; ⁷*Deut. Zeits. f. Chir.* 1930, cccxiv, 323; ⁸*Surg. Gynecol. and Obst.* 1932, liv, 81.

SUBDURAL HÆMATOMA IN INFANTS.

John Fraser, Ch.M., F.R.C.S.Ed.

According to M. M. Peet and E. A. Kahn,¹ subdural hæmatoma is liable to be confused with idiopathic hydrocephalus, and, for this reason particularly, it is worthy of careful consideration.

SYMPTOMS.—The symptomatology is one of increasing enlargement of the head, the development being usually associated with convulsions. The shape of the head resembles that of hydrocephalus, but the expression is alert, in contrast to the apathetic physiognomy of the hydrocephalic child. A downward displacement of the eyes is common to both conditions.

DIAGNOSIS.—The diagnosis is established by fontanelle puncture; in hydrocephalus fluid is not withdrawn until the lateral ventricle is entered at a depth of 1 to 2 cm., while in subdural hæmatoma a hæmochromatic or blood-stained fluid is obtained as soon as the fontanelle is punctured.

PATHOLOGY.—The sequence of pathology is evidently as follows. A hæmorrhage from the superior cerebral vein enters the subdural space, and this is followed by an encapsulating organization on the deep surface of the dura and on the superficial area of the arachnoid, with the result that a subdural hæmatoma becomes encysted with an acquired capsule of a vascular and organized membrane. The hæmorrhage is the result of trauma, the line of force being in an anteroposterior direction, but it is evident that malnutrition as an influence leading to scorbutic changes is an important subsidiary factor in the etiology.

TREATMENT.—The treatment recommended is a **Decompression** accompanied by an osteoplastic flap exposure. The fluid is evacuated, and the acquired encysting membrane is removed by gentle gauze dissection. It is considered unlikely that aspiration or tapping will prove sufficient to cure the error.

This is an important contribution in so far as it draws attention to a condition often unrecognized which is liable to be confused with the relatively hopeless condition of hydrocephalus, but which itself is amenable to surgical interference.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* xviii, No. 22, 1851.

SUBPHRENIC ABSCESS.

A. Rendle Short, M.D., F.R.C.S.

D. C. Elkin¹ (Atlanta) advocates a **Two-stage Transpleural Operation** for subphrenic abscess when the pus is above the liver. At the first stage about 2 in. of the 8th and 9th ribs are resected, the pleura opened, and the parietal pleura sewn to the diaphragm. A gauze pack is tied in. After forty-eight hours, when the pleural cavity is safely shut off by adhesions, the pus is located by exploring needle through the diaphragm, and drained.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1932, Oct., 1279.

SUPRARENAL GLANDS. (See ADRENAL GLANDS.)

SURGICAL TECHNIQUE. (See also SKIN-GRAFTING.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

A Simple Face-screen.—K. H. Digby¹ states that in operations upon the head and neck it is always desirable to shut off the more or less septic nose and mouth region from the operation area. Various methods are in common use, but they are not entirely satisfactory. An ideal face-screen must be easily applied, and it should be capable of adjusting itself with changes in position of the head and neck. It should be impervious to watery fluids, and should not interfere with a clear view of the face, by the surgeon as well as by the anæsthetist. Digby's note describes a simple face-screen which in his experience has fulfilled these requirements.

An old celluloid X-ray film is soaked in boiling water to which a little washing-soda has been added.

and the gelatin emulsion is gently wiped off with a soft cloth. With care the celluloid can be completely cleaned without being scratched. The sheet of celluloid is then cut to form screens of convenient sizes, a larger one 12 in. by 7 in. and a smaller one 7 in. by 6 in. To one of the sides of the screen a strip of stout cloth 2 in. broad is attached, either by celluloid solution

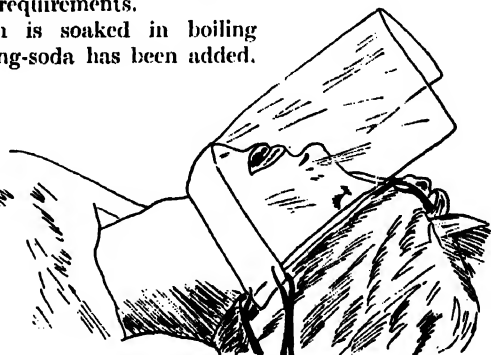


Fig. 71.—Face screen applied for neck operations.
(By kind permission of the 'Lancet'.)

in amyl acetate (or in acetone), or else by machine stitching or hand sewing. The cloth edge enables the celluloid sheet to be secured firmly to the towels, especially the one previously clipped round the patient's head. It is easy by using four clips to bend the thin celluloid sheet so that it stands well away from the nose and mouth. The accompanying illustration (Fig. 71) shows the screen applied for any operation upon the neck.

The celluloid is inflammable, and should not be used if a cautery or diathermy is to be employed. The screens can be sterilized by boiling for ten minutes in water. After being sterilized several times the celluloid begins to become opaque and fresh celluloid must be used.

Tourniquet Paralysis and its Avoidance by the Use of the Pneumatic Tourniquet.—The application of the old Esmarch's round tourniquet to the arm is quite unjustifiable. The danger of musculospiral paralysis is alone a contra-indication to its use, but there are many other disadvantages. If a tourniquet is required for the arm, the pneumatic tourniquet of the type used for taking blood-pressure is the correct form of appliance.

N. L. Eckhoff² makes a plea for the extended use of the pneumatic tourniquet. He states that he has been unable to find any reference to tourniquet paralysis in the English literature, yet the condition is very common. He states that most are agreed that the older thick rubber tube should never be used. A flat band seems safer, but, again, is not immune from serious consequences. [The reviewer has seen the same evil consequences from a flat band as from the rubber tube when applied to the arm.—W. I. de C. W.] "It is true", says Eckhoff, "that if the tourniquet is placed high up in the arm so as to encircle the mass of the deltoid, or around the mass of muscles immediately below the elbow, that paralysis does not follow with such readiness." Paralysis is practically unknown in the leg. The nerves, with the exception of the external popliteal, are well covered and protected by muscular tissues, and nowhere come into close contact with the bone.

The fact that the nerves are sensitive to pressure is well known. The axillary (circumflex) nerve is often affected in dislocations of the shoulder, and the radial (musculospiral) in 'Saturday night paralysis'. The ulnar nerve may be injured if the arm is left hanging against the edge of the operating table during anaesthesia, and is frequently compressed, even in the absence of vascular changes, by the fibrous band associated with a cervical rib. In some people if the arm is kept acutely flexed at the elbow with the hand at the back of the head, as when lying in bed, a tingling is produced in the hand, accurately corresponding with the area of distribution of the ulnar nerve. If the legs are kept crossed for long, a similar tingling occurs in the distribution of the common peroneal, due to pressure on its trunk behind the neck of the fibula.

From these considerations it seems almost certain that the paralysis following the use of a tourniquet is due to the effect of the direct pressure of the encircling band upon the nerves, pressing them against the bone, and not to any extent to the effect of a simple anaemia. This is borne out by the peculiar sensitiveness of the radial nerve, fitting in so well with anatomical considerations and so difficult to explain by any vascular process.

The pneumatic tourniquet is applied to the arm with the dial and rubber bulb pointing proximally. It is well to include the mass of the deltoid muscle, or, if the operation is upon the hand, to place the armlet around the mass of the forearm muscles. It can be used equally well in the leg. A pressure of some 20 mm. above arterial pressure ought to be sufficient, but Eckhoff generally uses a pressure ranging between 160 mm. (for young people) and 200 mm. (for old people). The tourniquet may be used in conjunction with an expression bandage (Esmarch's or Martin's) applied from the distal extremity of the limb, or alone after elevation of the limb for a minute or two. In any case it is placed in position before the commencement of the anaesthetic (thus saving the anaesthetic time) and inflated immediately before the operation is to begin. In an emergency it may be controlled by the anaesthetist, though obviously, as a rule, its care is best left to some other assistant.

In operations for sepsis in the hand it is invaluable, and, as its application is so simple, it is fair to say that no operation of this sort should ever be undertaken without its aid. In these instances a preliminary expression bandage is obviously contra-indicated, and if the tourniquet be inflated sharply

with the arm elevated, there is a trivial venous oozing upon the first incision which rapidly gives place to a bloodless field.

There is occasionally a slight leak in the instrument—in the valve at the air inlet near the rubber bulb. A light intestinal clamp or a pair of sponge-holding forceps applied to the afferent tube, leaving the dial in free communication with the rubber armlet, is usually sufficient to check this. It is well, however, to request an assistant to watch the dial occasionally and inflate from time to time if necessary. A linen bandage applied over the armlet helps to keep this firm.

Control of Bleeding.—Paul Deuticke,³ of Vienna, states that while adrenalin possesses the most admirable vasoconstrictive properties, its use is largely limited because of its secondary action—hyperemia and rise in blood-pressure. He states that it is gratifying, therefore, to have at our disposal a preparation, quite recently originated, that resembles adrenalin (to which it is related) but is devoid of the disadvantages. The substance to

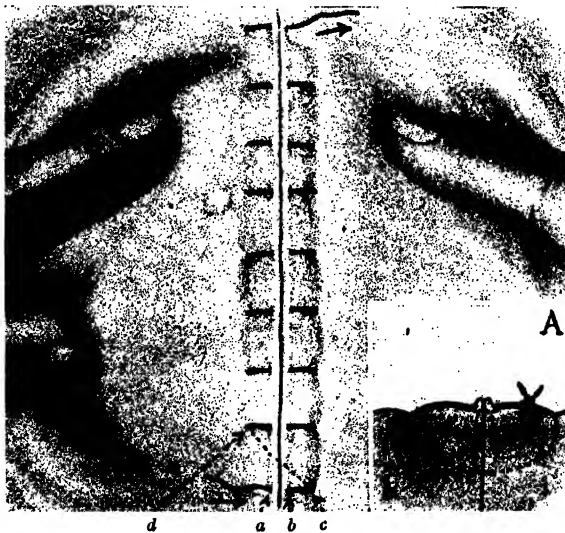


Fig. 72.—Superficial and deep continuous suture. Needle enters at *a*, passes through skin edges and comes out at *b*, passes through skin and subcutaneous tissue at *c*, then goes to *d*, and the same process is repeated. Note firm and even approximation at line of incision with no tendency toward separation even when tension is applied to it. Inset, *A*, shows the wide and close approximation of raw surfaces of skin and subcutaneous tissues *b*, brought about by the use of this suture. Compare with *Fig. 73*. (*Figs. 72–76 by kind permission of 'Surgery, Gynecology and Obstetrics'.*)

which this writer alludes is known as **Stryphnon**.* It is used to advantage in brain surgery, and has proved especially serviceable in operations on the liver, spleen, pancreas, kidneys, and in loosening extensive peritoneal adhesions. When mobilizing a gangrenous appendix the vessels of the extremely oedematous and fragile mesenterium cannot be readily clamped, and sutures and ligatures sever the diseased tissue; the bleeding is promptly controlled with the application of a packing of stryphnon gauze which is allowed to remain in contact from ten to fifteen minutes. Bleeding from the bones, whether during sterile operations or in sequestrotomy owing to osteomyelitis, is conveniently arrested with stryphnon powder. In

* Paines & Byrne Ltd., 31, Southampton Street, Fitzroy Square, London, W. 1.

gynæcology stryphnon is advantageously employed for the purpose of controlling uterine hæmorrhages.

In otolaryngology, stryphnon powder and gauze have proved highly serviceable, adding substantially to the surgical efficiency. The prompt control of capillary oozing greatly simplifies the checking of bleeding from larger vessels by mechanical means. Stryphnon gauze should be available to the house surgeon for use in arresting secondary hæmorrhages following the operation.

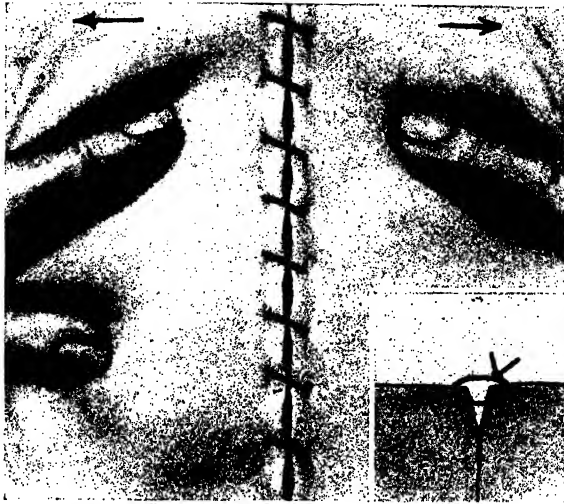


Fig. 73.—Ordinary continuous suture. Note gaping and separation of skin edges between sutures that may take place if tension is applied to them.

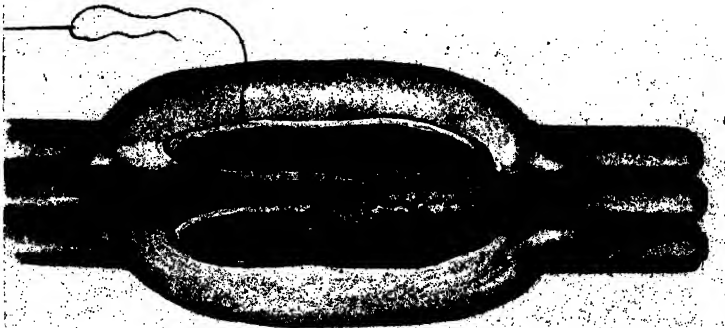


Fig. 74.—Suture for posterior wall of gastro-enterostomy. Note how the deep bite includes the entire thickness of walls of stomach and intestine, while the superficial bite includes and evenly approximates the cut edges of the mucous membrane as indicated by arrows.

Proctologists find stryphnon solution and suppositories efficacious in checking bleeding from the lower part of the colon and in the rectum.

Stryphnon has likewise secured a prominent position in urology. It is employed in prostatotomy in the form of a packing. The control of internal bleeding, particularly pulmonary hæmorrhages, is materially facilitated with stryphnon injections.

Superficial and Deep Continuous Suture.—J. Sarnoff⁴ describes a superficial and deep continuous suture for the skin which was also described by A. Edmunds some time ago (see MEDICAL ANNUAL, 1932, p. 505). Sarnoff

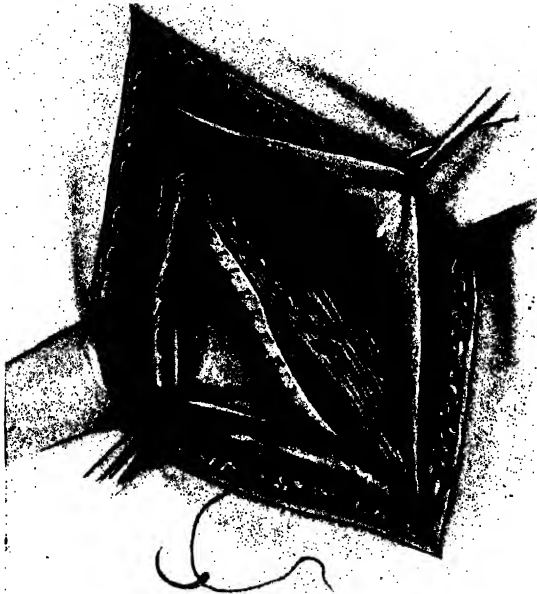


Fig. 75.—Suture for Bassini hernioplasty. It approximates a double fold of Poupart's shelf to a wider and thicker portion of conjoined tendon and thus avoids tearing through some of the fascial strands when the suture is tied.

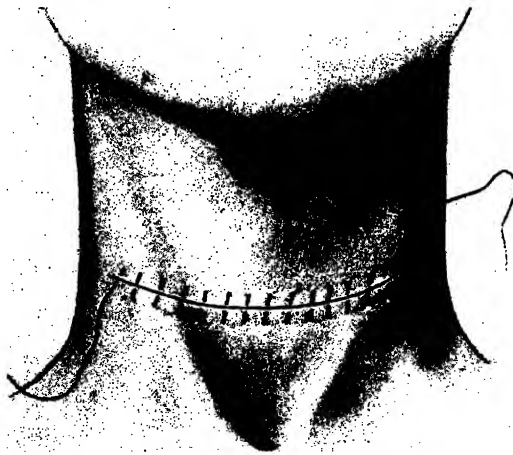


Fig. 76.—An ideal skin suture following thyroidectomy.

writes enthusiastically about this suture. He states that it is simple and speedy and fool-proof. The edges cannot invert or evert. The novice becomes master of the suture at the first attempt. [The reviewer has used the suture

on many occasions but its rapid introduction requires some practice. At first it is a time-consuming procedure.—W. I. de C. W.] Sarnoff's paper is of interest because he draws attention to the fact that it is useful in a good many situations apart from skin suture. Examples are shown in *Figs. 72-76*.

Evacuation of Deep-seated Abscesses.—A. S. W. Touroff⁶ deals with the evacuation of deep-seated abscesses such as may be encountered in

the lung or liver. He mentions the following procedure and condemns its employment: (1) Introduction of aspirating needle to locate the abscess cavity; (2) Introduction of grooved director alongside the needle—withdraw needle; (3) Introduction of blunt dressing forceps alongside grooved director to spread open the track; (4) Enlargement of the track to the desired width by means of a knife. These procedures are objectionable for the following reasons: (1) In introducing the grooved director alongside the aspirating needle after the cavity has been located, the surgeon often misses the cavity because he introduces the instrument for either too great or too short a distance. (2) The conventional blunt grooved director produces considerable trauma by tearing through indurated tissue when introduced. This is particularly true when dealing with inflamed pulmonary tissue. (3) The

blunt dressing forceps produces similar trauma when introduced, and especially when the blades are spread to tear open the track more widely. (4) The procedure, if carefully done, consumes considerable time.

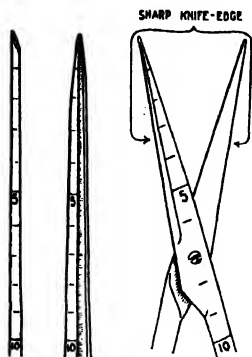


Fig. 77.—Enlarged view of tips of instruments.

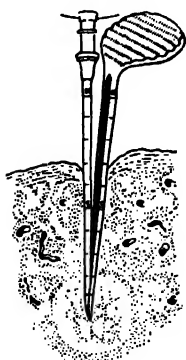


Fig. 78.

Fig. 78.—First and second steps. Aspirating needle has located pus at depth x . (Grooved director is then introduced for distance x .)

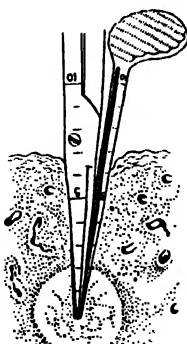


Fig. 79.

Fig. 79.—Third step. Aspirating needle has been withdrawn, leaving grooved director in place. Special knife-scissors is then introduced for distance x .

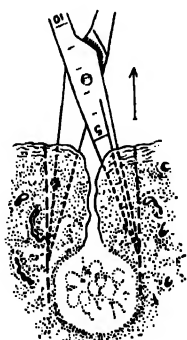


Fig. 80.

Fig. 80.—Fourth step. Knife-scissors is being withdrawn with blades open, thus creating a wide drainage track.

(Figs. 77-80 re-drawn from 'Annals of Surgery'.)

In order to obviate the above-mentioned difficulties, a simple set of instruments which has simplified and rendered the procedure more precise, was devised. The set consists of: (1) Aspirating needles which are calibrated in centimetres; (2) A grooved director similarly calibrated and bearing a sharp cutting point; (3) A special pair of scissors which resembles an ordinary

sharp-pointed, long-bladed pair, with the exception that the back of each blade is ground down to a fine cutting edge—one blade and shank are calibrated in centimetres. In opening a deep-seated abscess with this set of instruments, the procedure consists of locating the cavity in the usual manner with the aspirating needle, at the same time noting the depth at which pus is encountered. This depth is readily visible on the calibrated needle. The calibrated sharp-pointed cutting grooved director is then readily introduced alongside the needle, for exactly the same distance, thus making sure that the tip of the grooved director lies in the abscess cavity. The aspirating needle is then removed. Next, the special pair of scissors is introduced alongside the grooved director for the desired distance as noted on the calibrations, and the blades are opened. The scissors are then withdrawn, holding the blades firmly in the opened position. This manoeuvre enables the surgeon to open the cavity as widely as is desired, as the cutting edge on the back of each blade acts as a knife. By opening the blades to the desired position, a drainage track of any given diameter can be readily produced (*Figs. 77-80*).

REFERENCES.—¹*Lancet*, 1931, ii, 1294; ²*Ibid.* 343; ³*Med. Jour. and Record*, 1931, Nov. 18, 503; ⁴*Surg. Gynecol. and Obst.* 1931, Oct., 539; ⁵*Ann. of Surg.* 1931, Sept., 477.

SYMPATHETIC NERVOUS SYSTEM, SURGERY OF. (*See also* ANGINA PECTORIS; RAYNAUD'S DISEASE.)

Goeffrey Jefferson, M.S., F.R.C.S.

In the MEDICAL ANNUAL of 1932 (p. 507) the writer reviewed the recent work on the surgery of the sympathetic nervous system. Knowledge remains in a somewhat fluid state, but the fundamental principles upon which surgical treatment is based are sufficiently logical and sound for us to be able to look forward with some confidence to the future.

Although some of the cases on record have now been operated upon some years ago, it would be true to say that the greater number have been done within the last three years, and an increasing number as each year passes. The figures are therefore mounting up in a steep curve graphically, but the greater part of this mass is not yet available for critical review because it is too recent. During the past year two further painstaking general reviews have appeared, one by Archibald Young,¹ the other by John Fraser,² both papers being fortified by the inclusion of a few personal cases. In addition some large series of cases have been reported, notably by E. D. Telford,³ J. Diez,⁴ H. Ito and G. Asami,⁵ accounting for 146 operations, chiefly lumbar ganglionectomies. The inevitable paper on accidents and unforeseen complications has been supplied by E. Hesse,⁶ and will be referred to presently.

Peri-arterial Sympathectomy.—This operation has to-day lost the popularity that it had a few years ago, and indeed most of those who supported it then have been converted to ganglion-chain resections. It is true that occasionally a very good result has been achieved by the older method. Charbonnel and Massé⁷, for example, report an excellent result from peri-arterial decortication on the axillary artery of 5.0 cm. length in a patient suffering from Raynaud's disease. The hand became warm and ulcerations of the finger-tips healed. Such results are not easily explained on physiological grounds. We know that the nerve-supply to the vessels of the limbs do not run out in a continuous uninterrupted sheath, but reach the vessel *seriatim* as reinforcements arising from the peripheral nerves. In an admirable review J. S. B. Stopford⁸ has summarized our knowledge on the course of the fibres, and the fact is that although there is unquestionably a sympathetic sheath around the arteries, and that this is derived ultimately from the

paravertebral ganglionic chains, the chief branches pass at once into the peripheral nerves, along which they proceed until called for from level to level to supply the vessels. An attack on the paravertebral ganglia is therefore a more logical and economical method of suppressing the vaso-constrictors. Further, Lambert Rogers⁹ has published experiments and observations which indicate that the effects of peri-arterial sympathectomy are exhausted about the forty-fifth day. Ito and Asami obtained the same result; after the eighth day there is a decline in the so-far increased blood-flow to the limb, and forty-one days after the peri-arterial strip there was no difference between the operated limb and the control. These workers record an important observation made by Osawa—namely, that division of the posterior nerve-roots prevents any vasodilatation whatever after Leriche's peri-arterial neurectomy. Also that section of the roots stops a pre-existing dilatation produced by that step. They conclude that the dilatation is a reflex, and thus explain in some degree the discrepancy between the actual facts observed clinically, and the known pathways for the efferent vaso-constrictor fibres. This explanation does not affect the fundamental fact that peri-arterial neurectomy produces effects which last at the most for five weeks. Many will regret the decline of this comparatively simple operation, but it was a curious fact that the results were never very good in the hands of sceptics, and always wonderful in the hands of the more sanguine.

Vasospasm and Vascular Obliteration.—Ito and Asami⁵ apparently arrived at the idea of abolishing vasospasm by ganglionectomy independently of workers elsewhere. Kobayashi, in their laboratory, had found that after lumbar sympathectomy in the dog the blood-flow in the corresponding limb was increased and remained so for 192 days, the longest period of their observation, and that the vessels lost their contractility to cold whilst retaining the usual adrenalin response. Uno, in the same laboratory, tested the effects of healing of experimental fractures after sympathectomy, concluding that there was pronounced enhancement of healing. This method of dealing with delayed union has already been put into practice (Rubaschow). Ito and Asami give a tabulated review of the effects of ganglionectomy on 27 cases of *thrombo-angiitis obliterans*. Most of their patients were farmers, all were males, the average age being 38.7 years (youngest 23, oldest 51), and the average duration of symptoms four years. The incidence of the disease in farmers in Japan is interesting, for it appears that their long-continued exposure through standing in water to plant rice in the rainy seasons may have been a decisive factor. It has been found that when pulsation is still present in the dorsalis pedis at the time of operation the results have been uniformly beneficial; but that when this pulsation is absent, and more particularly when pulsation in the still larger vessels (e.g., popliteal) is difficult to palpate, the improvement obtained is slight or nil. On this point all surgeons are now agreed, and Telford³ in particular makes a plea for earlier operations, not only in obliterative conditions but in vasospastic ones as well, for he believes, and with some reason, that spasm leads to endomural changes in the vessels. The logical conclusion is that patients must be advised to have sympathetic ganglionectomies performed before they have become so bad that they demand it for themselves. Naturally enough the early history of this new surgery must be that of an attack on the more advanced cases first. That time is now over, and, having learned our lessons, we can apply them to the earlier and more promising type. What is that type? It is the case in which complaint is made of dull aching in the calf and of pain in the heel or foot, especially after exercise. The foot feels cold, and looks blanched or slightly cyanosed, but improves with rest after a few minutes. This picture is that of a mild

intermittent claudication (which is of course a clinical label and not a disease). Patients should be operated upon within three months of the onset of these symptoms, and not, as is so often the case, many years afterwards.

Reference must be made to Diez's⁴ paper, for he reports no fewer than 75 lumbar gangliectomies on 68 patients with thrombo-angiitis obliterans: 58 operations gave brilliant results, 17 were failures, but we must note that there were cases so advanced that gangrene had set in. Of those improved, 2 were free from recurrence after six years, 2 after five years, 2 after four years, 5 after three years, and so forth, indicating a lasting benefit.

Selection of Patients for Operation.—In the review of last year considerable attention was paid to the selection of patients for operation. To that end a number of ingenious tests have been thought out, not only the original fever test of Brown but the more selective novocain tests of Morton and Scott, of White, and of P. G. Flothow¹⁰ (*see* MEDICAL ANNUAL, 1932, p. 510). These tests have occupied an important place in the evolution of denervation as a sound surgical procedure, and in the unravelling of the problems presented by individual cases. It is true that to those who are already cultured in this type of work, these tests are often not necessary. The experienced know that this individual, say, who has non-pulsating vessels, who has a ten-year history of local spontaneous gangrene, who has already lost several toes, who cannot walk more than a hundred yards without having to rest, is one who is not likely to be materially helped. They know, *per contra*, that this other with vasospasm only, and main arteries which beat firmly, whose more peripheral vessels only are affected, is one suitable for surgery. But there is, and always will be, an intermediate class in which it is impossible to forecast accurately what the result will be. In such cases the application of the novocain tests are most helpful. And they are not only helpful, but, in the writer's view, essential for the self-education of those surgeons who are entering as novitiates on this new experience. The uses of spinal anaesthesia as a method of selecting patients for operation is now well known; it causes a rise of temperature in the lower limbs if the vessels are dilatable and not too rigid or, indeed, impermeable. But it is available only for the lower limbs, and gives no indication as to pain relief, for all sensation is abolished. The alternative method, introduced by White and by Flothow, is the paravertebral injection of novocain with the object of producing a trial paralysis of the sympathetics. Temperature readings are taken for twenty minutes at intervals of five minutes, and a rise of 5° C. is essential as an indication for operation. The room temperature must be about 60° F.; a hot operating theatre is unsuitable, and the limb should be exposed to the air for some time beforehand. In thrombo-angiitic subjects a marked increase in skin temperature means that sympathectomy will give good results; but if a rise does not occur, amputation is the only surgical treatment possible.

Therapeutic Injections.—Flothow, who has done much to help elucidate these problems by pre-operative novocain studies, has, in suitable subjects, gone on to inject **Alcohol** as an alternative to open operation. It is not suggested as a method likely to supersede sympathectomy, but as a means of treatment in patients who for one reason or another are unsuitable for the operation. Flothow remarks, truly enough, that the chief stumbling-blocks to the advance of the surgery of the sympathetic system are, on the one hand, the uncertainty and empirical nature of the operative results, and, on the other, the magnitude of the operation required. The tests alluded to and the growing surgical culture in this subject are removing the first reproach, but the second is insurmountable. He suggests that alcohol injections are, from his own experience, a useful method. He makes it plain that he does not

think that they will replace operation; he calls it a 'glorified diagnostic procedure', the observed results of which on any particular patient may warrant sympathectomy later on.

Flothow's work on *angina pectoris* has already been recounted (MEDICAL ANNUAL, 1932, p. 511). He has now made alcohol injections on 12 cases with arteriosclerotic pain and trophic conditions, with excellent immediate results. If almost instant relief of pain is obtained after injection of 1 per cent novocain, 5 to 7 c.c. of 95 per cent alcohol is immediately injected in each needle. He finds, indeed, that during the period that these and other patients have been under observation the results are exactly comparable with surgical extirpation. The method has been successful in some cases of atypical facial *neuralgia* and in *asthma*, as well as in angina. He raises the question of alcohol injection of the lumbar ganglia for *diabetic gangrene*. This is an interesting problem, for these are not patients whom the surgeon will easily accept for major surgery. Flothow reports two diabetic cases where the injection of a total of 20 c.c. of alcohol into the region of L. 1, 2, 3, 4 (presumably 5 c.c. at each level, using Labat's technique), one a diabetic neuritis, the other also a neuritis, with unhealed toe amputation stump, brought about improvement. Flothow's tabulation of 51 cases, which gives an honest account of test injections and alcoholization in a variety of conditions, repays study.

Hirschsprung's Disease and Chronic Constipation (see also article HIRSCHSPRUNG'S DISEASE).—The excellent effects of sympathectomy in these conditions is now well-established. H. C. Trumble¹¹ reports 5 cases from Australia of chronic troublesome constipation cured by sympathectomy. In his first case the colon emptied once a week before operation, and once or twice daily afterwards. Comparable results were recorded by R. H. Boggon¹² on Sargent's cases, and as time passes no doubt an increasing number of patients who are in a degree disabled by this state will come to operation.

Failures and Dangers.—Failures after sympathectomy may be summarized as being due either to incorrect choice of the patient to be submitted to operation or to failure to perform the operation sufficiently well. Periarterial sympathectomy undoubtedly led to several disasters, which have usually not been reported. The accidents occurred owing to the brittleness of the vessels in arteriosclerotic persons, and the common femoral and carotid are known to have been ruptured in the course of carefully performed sheath neurectomies. But accidents have happened also during ganglionectomies. Hesse refers to the important structures which lie in the immediate neighbourhood of the stellate ganglion. He says that in 70 cases of cervical sympathectomy he has once injured the vertebral artery during the mobilizing of the ganglion, no untoward happenings following the ligation of the vessel. Similar accidents have befallen the thoracic duct: Kümmell reports an injury; Hesse has had to tie it; and Brüning resected 5.0 cm. of the duct with perfect wound healing and no ill effects. Injuries of the pleura occur not uncommonly during this operation; this ought not to happen, and there is little danger if it does, though Jirasek records a hæmothorax after ganglionectomy, and the possibility of empyema comes to mind if the technique is vulnerable. Another complication common to all sympathectomies is the possibility of post-operative neuralgia or pain in the head or limbs. This is due to traumatizing the large nerve-trunks nearby. It is a common sequel (25 per cent Hesse, 23 per cent Leriche). It commences during the first week, rarely later, it may last for one to two years, and it can be exceedingly severe. It is therefore something to be reckoned with, and the knowledge of its possibility will no doubt bring about more care in the handling of the nerve-trunks, and a fall in the incidence of this consecutive pain. Hesse has seen pain in the face very similar to

trigeminal neuralgia after sympathectomy, and this is odd, because the operation is recommended for certain facial neuralgias. Paresis of the arm may follow a rough dissection of the stellate ganglion, and several cases have been reported by different authors (according to Hesse), some with muscular atrophy, from Jonnesco's day down to the present time.

As for lumbar sympathectomy, the chief danger is injury to the inferior vena cava during ganglionectomy on the right side. Hesse admits having had this happen. A lumbar vein tore off close to the vena cava, its mouth was seized with artery forceps, which cut in, and the hole was made larger. Bleeding was stopped by a lateral suture of the vena cava. These lumbar veins are longer on the left side, and the aorta, which is more difficult to injure, intervenes between the operator and the cava. On the right side the veins may be too short for division between two ligatures. The proper method of dealing with them, not mentioned by Hesse, is by means of strong silver or metal clips. Most of the complications mentioned by Hesse are well known, except perhaps the post-operative neuralgia, and none of them will present any serious obstacle to the careful or to the courageous surgeon.

REFERENCES.—¹*Glasgow Med. Jour.* 1931, July 1; ²*Edin. Med. Jour.* 1931, Dec., 189; ³*Lancet*, 1932, ii, 771; ⁴*Jour. de Chir.*, 1931, xxxvii, 161; ⁵*Amer. Jour. Surg.* 1932, Jan., 26; ⁶*Deut. Zeits. f. Chir.* 1932, Jan., 17; ⁷*Bull. et Mém. Soc. nat. de Chir.* 1931, Dec., 1473; ⁸*Lancet*, 1931, ii, 779; ⁹*Brit. Jour. Surg.* 1931, July, 52; ¹⁰*Amer. Jour. Surg.* 1931, Dec., 591; ¹¹*Med. Jour. of Australia*, 1931, Oct., 405; ¹²*Brit. Med. Jour.* 1932, Aug. (B.M.A. Meeting).

SYPHILIS.

Col. L. W. Harrison, D.S.O.

Serum Tests.—E. J. Wyler¹ has further modified No. 1 Method of the Wassermann test so as, with safety, to make it more sensitive. In the new method the quantity of serum employed in the test is increased considerably, the technique in other respects being unchanged. The result is stated to be more sensitive than the Sigma and 20 per cent more sensitive than the No. 1 Method as modified first by Wyler. [The latter method proved the most sensitive of those which gave no non-specific result at the Serum Conferences in Copenhagen in 1923 and 1928, whilst it was practically equal with Sordelli's at Monte Video in 1930.—L. W. H.]

L. Tulipan and W. Director² report on the micro-precipitation test described by L. Rosenthal.³ In this test four drops of inactivated serum are placed in a hollow slide and one drop of antigen is floated on it. After two minutes the slide is rotated in the horizontal plane thirty times, and the result is read with the microscope under low power, a positive reaction being indicated by more or less clumping. The author's analysis showed that it gave no false positive and was rather more sensitive than the Wassermann test employed in parallel with it on 628 syphilitic and 439 non-syphilitic sera.

T. E. Osmond and K. E. Hughes⁴ report on a comparison of the Kline slide precipitation test with the Wassermann in 2000 sera. Comparisons were also made with the Kahn and Sigma tests. The Kline test proved much more sensitive than the Wassermann and rather more so than the Kahn and Sigma. On the other hand, it proved less specific than these, giving 19 false positives in the series of 128 non-syphilitic sera.

B. S. Levine⁵ discusses the Wassermann and precipitation tests from the biochemical point of view and reports a number of experiments which lead to the conclusion that the two types of test are mutually supplementary, so that to replace one with the other would be to weaken the diagnostic armamentarium.

Prognostic Significance of the State of the Cerebrospinal Fluid.—

H. H. Hopkins⁶ has traced the later history of 405 syphilitic patients observed for two to ten years after being found to have negative spinal fluid. Of the

405 cases, 161 had early syphilis when first tested, and in 100 of these no further test of the spinal fluid was made; 2 of these later developed undoubted and 1 doubtful clinical signs of neurosyphilis. In 59 of the 61 whose cerebrospinal fluid was re-examined it was found to be still normal, but definite signs of neurosyphilis developed in 4, as also in 2 cases in which the cerebrospinal fluid was found to have become pathological. In all 6 cases the signs were those of a neuro-recurrence occurring shortly after a lapse from treatment. In 244 cases syphilis was latent, and the duration of infection was from one to forty-five years. Only 2 of the cases subsequently developed definite signs of neurosyphilis. This experience contrasts with that of J. E. Moore and H. H. Hopkins⁷ in cases with positive fluid. In 123 of these within a period of observation of seven years, 15 per cent had developed grave and disabling forms of neurosyphilis, and a further 30 per cent had shown signs permitting of a tentative diagnosis of neurosyphilis. The details show that the gravity of the prognosis increased with the severity of the pathological changes in the fluid.

T. F. Hower⁸ has examined 313 cases of syphilis in various stages to ascertain the relationship if any between pressure of the spinal fluid and syphilis. After taking precautions against falsifying factors in taking the reading he concludes that there is little evidence that increased pressure is either a common or reliable indication of syphilis of the central nervous system. He says, "The constant quotation of this sign in the text-books is the result of inaccurate observation."

Syphilis and Cancer.—G. H. Belote⁹ has investigated the incidence of syphilis in 1267 cancer cases at Ann Arbor, Michigan. In 232 cases of cancer of the cervix 35 gave positive serological reactions of syphilis, a rate of 15.1 per cent. The rate in cancer of the tongue was 30 per cent, in cancer of the lip 8.8 per cent, and in cancer cases generally 6.6 per cent, while the average for hospital cases of all kinds was about 5 per cent. [The late H. J. B. Fry¹⁰ found positive syphilitic serum reactions in 18.3 per cent of cases of cancer of the cervix and in 35 per cent of cancer of the tongue, so that the two sets of figures seem to show a definite predisposition to cancer in syphilis of both the tongue and the cervix uteri.—L. W. H.]

Latent Syphilis of the Testicle and Sterility.—E. Bertin, P. Nayrac, and A. Breton¹¹ discuss the question of sterility (apart from impotence) in syphilitics, and describe microscopic lesions in the testicles of certain of them which would partly explain it. Syphilis has long been suspected as one of the causes of sterility in the male. Jeanselme and Sézary hold that the proportion of sterile marriages is higher in syphilitics than in normal persons. Kraepelin puts the percentage at 17.8, Junius and Arndt found it 23.26 in male general paralytics and 36 to 40 in female. Spillmann and Perrin found 15 per cent of paralytics and 19 per cent tabetics sterile, and L. Perrin found the same in 30 per cent of syphilitic marriages; one of the authors, in collaboration with Schulmann, has generally confirmed these figures. The authors discuss such possible reasons as diminution of the mobility of the spermatozoa and malformation of these, but do not find the evidence convincing. On the other hand, they have found oligospermia in 10 per cent of syphilitics in whom no gonorrhoeal or other infection could be held responsible, and azoospermia was found by two of the authors in 6.15 per cent of 65 syphilitic subjects; other workers have reported to much the same effect. The authors have examined histologically the testicles of 19 neurosyphilitics immediately after death and found generally as follows: In 14 there was a testicular arteriosclerosis, and in 10 an interstitial sclerosis of varying degree. In 8 there were signs of a plasmolymphocytary infiltration, which was limited

in 3 cases to the vessels, and in 5 spread through the vascular and connective tissue. There was thickening of the connective-tissue layer of the tubules in 11 cases, and this did not coincide necessarily with sclerosis of the remainder of the connective and vascular tissue. The degree of thickening varied. Most often it was only twice the normal, but in 4 cases it had caused complete obliteration of the epithelial tissue of certain tubules. The epithelium was correspondingly reduced, and in the last degree there were only collagenous clumps in vestiges of the original tubes. Often the number of tubules was reduced, sometimes to as little as 19 per cent of the normal. The author attributes the changes primarily to a diffuse interstitial infiltration of the vascular and connective tissues which leads secondarily to sclerosis and to disturbance and destruction of the spermatogenic tissue. This would explain not only the oligo- and azoospermia of certain syphilitics but also the developmental defects of the children of syphilitic fathers. [This note on a chronic interstitial infiltration of the testicle is especially interesting in comparison with the note below on what seems to be essentially a similar process in the kidneys described by Rich. It may be recalled that Warthin insisted that the lesion typical of tertiary syphilis was not so much a gumma as a fine mononuclear infiltration resulting in fibrosis and, through this, in destruction of the parenchyma.—L. W. H.]

Syphilis of the Kidneys.—A. R. Rich¹² draws attention to a hitherto unrecognized kidney lesion which he found post mortem in 19 cases. Its incidence in the kidneys of 200 cases with syphilitic lesions of other organs was 6.5 per cent. As a control, the same lesions were looked for in 400 cases in which no syphilitic lesion was found in the organs at autopsy. The lesions under description were found in 2 of the 400, and in each of these the clinical records disclosed positive serum reactions, whilst one had a definite history of syphilitic infection. These facts led the authors to believe that the kidney lesions must be syphilitic. Macroscopically they were minute, glistening, greenish-yellow flecks like grains of sand scattered here and there beneath the capsule and in the cortex. Microscopically they were found to consist of dense focal accumulations of mononuclear cells in the interstitial tissue, especially in the cortex. They might be just beneath the capsule or in the deeper layers, the larger ones extending down to the medulla. There were also distinctly perivascular mononuclear accumulations. The cells were chiefly small lymphocytes, but there were also large lymphocytes, macrophages, and plasma cells as well as sometimes a few eosinophils. They might project into tubules, destroying the basement membrane and pushing forward the consequently degenerated layer of epithelium until an accumulation of cells lay well within a tubule in the form of a sphere with a pedicle joining it to the parent infiltration. Such a condition was found particularly in tubules which had become dilated because of obstruction below caused by the interstitial infiltration. They appeared superficially like glomeruli. The extent of the process varied: sometimes only one or two areas were affected, but in others the involvement was very extensive. In five cases such lesions as those described were the only anatomical evidence of syphilis in the tissues, but in all these the serum reactions had been strongly positive. With regard to the recognition of the condition during life, the author suggests that, as these accumulations push their way into the tubules, lymphocytes may be found in the urine, and this proved to be so in one of the cases.

Congenital Syphilis.—The incidence of congenital syphilis in children under the care of the Department for the Young in Hamburg has been studied by F. Leo,¹³ who found only 0.31 per cent in 175,108. The figure is considerably smaller than those given by other workers, but these were not unselected as

they were mostly in a hospital population. The low percentage found by Leo is remarkable also from the fact that it was found in children of persons mostly of degraded classes who might be expected to suffer more heavily from syphilis than do the average. He did not find that the children of syphilitic parents suffered more from developmental defects than did those of non-syphilitic. The same applied to the syphilitic infants, but amongst these the percentages of developmental defects were less in those who had been treated early. [In this he is strongly in opposition to various workers, especially French, who attribute all kinds of defects to syphilis in parents.—L. W. H.] With regard to the question of treating the offspring of syphilitic parents, in order to prevent the development of syphilis in them, Leo is in favour of waiting for signs before treating. He is thus in opposition to E. Hoffmann, who advocates the treatment of infants born of syphilitic mothers who were not treated during pregnancy; to Martin and Vierkotten, who treat the infant if the mother has given a positive serum reaction during pregnancy; and to Rossianski and Pelevina, who treat if the mother has shown signs of early syphilis in the pregnancy and has not been treated.

K. Lieler¹⁴ opposes the gloomy views of Spitzer (reviewed below) as to the outlook for offspring of syphilitic parents. Also he does not think it necessary to treat every syphilitic woman throughout each pregnancy (as is commonly taught) if the woman has previously been treated thoroughly. In support of this view he quotes G. Birnbaum,¹⁵ who reported healthy results of 34 pregnancies of 21 women who had been well treated before the pregnancies but not during them. L. Spitzer,¹⁶ on the other hand, expresses the view that no mother infected during pregnancy, whether she is treated or not, can bring forth a completely healthy child; if it is observed sufficiently long (not less than ten years), abnormalities will be found. Amongst the defects included in his list are bad scholarship, debility without definite signs of syphilis, a disposition to anginas and eczemas, inclination to crime, and so forth. He concludes with rules to the following effect: (1) If only one party to a marriage is infected, forbid it; (2) If both are infected, allow marriage but forbid offspring; (3) If a mother has had a syphilitic child, forbid more offspring; (4) On the other hand, if a man has had syphilis and been cured, he may possibly beget healthy children. [Such views as Spitzer's show the depths of pessimism to which some workers can descend. If the findings on which they are based were generally applicable, we should expect to see hare-lip, club-foot, and the like in every street of almost every town!—L. W. H.]

R. Spiegler¹⁷ recommends that if a specimen of blood has not been taken previously, one of retroplacental blood be tested at the time of labour. He has found that such specimens afford quite reliable results. He is also an advocate of the generally recommended principle of treating every pregnant syphilitic woman whatever the previous treatment or the serum reactions. He believes that pregnancy is an activator of the disease and may set spirochetes circulating in a hitherto completely latent case of syphilis, with resulting infection of the foetus.

PROPHYLAXIS.—Krulle¹⁸ reviews the various methods of preventing syphilis in the individual by administration of drugs, and rejects the **Arsenobenzene** preparations because their effect is not sufficiently lasting. **Stovarsol** administered by the mouth has the disadvantage that it requires medical supervision. On the other hand, a deposit of **Bismuth** in the gluteal muscles proved to be a very efficient prophylactic in the case of 60 prostitutes, none of whom became infected, while of 50 other prostitutes observed during the same period of eighteen months but not treated with bismuth, 20 contracted syphilis. The

results agree substantially with those obtained by Sonnenberg with 100 prostitutes. Krulle suggests that the method should be applied to prostitutes and to seamen whilst ashore. He recommends a weekly dose of 1.0 to 1.5 c.c. of **Bismogenol**, which is painless and comes quickly into action. [The dose seems to be rather small.—L. W. H.]

TREATMENT.—A. B. Cannon and M. B. Karelitz¹⁹ have analysed the results of treatment of over 5000 syphilitic patients by different types of **Arsenobenzene** preparations, and conclude that of these the original '606' is better than **Neosalvarsan**. They say that it requires fewer injections, a smaller amount of the drug, and a shorter time in which to bring the serum reactions to negative. The incidence of jaundice was slightly less in the '606' group of cases than in the '914'.

The Value of Stovarsol in Neurosyphilis.—G. W. Raiziss and M. Severac²⁰ have made an experimental study of 3-acetyl-amino-4-hydroxyphenyl-l-arsonic acid known variously as **Acetarsone**, **Stovarsol**, or **Spirocid**. The lethal and tolerated doses of this preparation found by various authors vary very widely. Thus Levaditi and colleagues found 0.6 gm. per kilo killed rabbits when administered orally, while 0.3 to 0.4 gm. per kilo was tolerated. Collier and Evers, on the other hand, put the minimum lethal dose at only 0.05 gm. per kilo. Other workers have obtained figures intermediate between these extremes, and Raiziss and Severac attribute the discrepancies to variations in purity of the product. They have used a particularly pure preparation which was well tolerated by rabbits in doses of 1.0 gm. per kilo when given by mouth, while the sodium salt was tolerated in a dose of 0.5 gm. when given intravenously. They found that acetarsone had a comparatively poor therapeutic index in experimental trypanosomiasis. With regard to syphilis, Levaditi and his colleagues found that doses of 0.1 to 0.7 gm. per kilo given by mouth to rabbits two hours, six hours, one day, or seven days after inoculation were prophylactic. These results were generally in disagreement with those of Collier and Evers and of Worms, the latter of whom prevented syphilis in only two out of eight animals with a dose of 0.25 gm. per kilo. Raiziss and Severac found that 0.05 gm. per kilo administered by mouth immediately after inoculation prevented syphilis in all seven rabbits tested, but doses of 0.025 gm. failed to protect. To test the therapeutic effect six doses of 0.05 gm. per kilo were given by mouth to syphilitic rabbits on alternate days, and thirty-two days later the treatment was resumed with a weekly dose of 0.05 gm. per kilo to a total of four doses. This treatment proved curative. Raiziss and Gavron have shown that the pentavalent group of arsenicals, to which acetarsone [like tryparsamide] belongs, penetrate the central nervous system much more easily than do the trivalent. Raiziss and Severac inoculated a number of rabbits intraspinally with emulsion of *Sp. pallida*. Without treatment animals so inoculated develop scrotal, testicular, or generalized lesions two to four months later. The authors injected rabbits intravenously with 0.05 gm. of the sodium compound two hours after inoculation and they remained normal for long periods. For these reasons the authors think the preparation worthy of consideration in the treatment of neurosyphilis. They quote Sézary and Barbé, who have used the French preparation, stovarsol, in the treatment of general paralysis, 'with rather favourable results'.

J. V. Lichtenstein²¹ reports a high proportion of good results of **Tryparsamide** treatment in 11 cases of general paralysis and 23 cases of syphilis of the supporting and vascular structures of the central nervous system. In 41 cases of tabes there was marked improvement in 14, definite in 7, and none in 19. She gave it in courses of eight to ten injections of 3 gm. per injection, and the number of courses seems to have been from three to four. She

advocates also the use of **Mercury** or **Bismuth**, either in the intervals between courses of tryparsamide or simultaneously.

Bismuth.—P. J. Hanzlik and colleagues²² report on experiments to determine whether or not **Bismuth** acting as an anion would penetrate the central nervous system more easily than when it is administered as a cation, i.e., in its basic form [the one in which it is present in most of the preparations employed for the treatment of syphilis.—L. W. H.]. The anions bromide and iodide penetrate the brain and appear in the cerebrospinal fluid. Strecher, who quotes others to the same effect, claims that the diffusible cations do not penetrate so readily as the anions, and the authors agree with most other workers that bismuth in the basic form does not readily penetrate the central nervous system. In their experiments they employed sodium iodo-bismuthite dissolved in ethylene glycol. (The preparation is called **Iodo-bismitol*** and contains 21 per cent of bismuth metal.) After its administration bismuth was found in the cerebrospinal fluid of 37 out of 40 patients, and it was also found in the brains of guinea-pigs after similar injections. On the other hand, after injections of bismuth metal, potassium bismuth tartrate in oil, or bismuth salicylate in much greater dosage, no bismuth was found in the spinal fluid of 13 out of 17 patients, while in two of the remainder the results were doubtful. The dosage of iodo-bismitol recommended by the authors is 2 c.c. three times a week. [**Iodo-bismuthate of Quinine** seems to be the only preparation used in this country in which the bismuth is anionic. Such a compound would appear to be the bismuth preparation of choice in the treatment of parenchymatous neurosyphilis.—L. W. H.]

Pyrexial Treatment.—C. C. Dennie and his colleagues²³ have found **Malarial Treatment** valuable in early acute interstitial keratitis, in hyperplastic bone syphilis, and in other resistant forms of syphilis. They believe that it acts by raising the immunity rather than by directly destroying *Sp. pallida*, and consequently they advise that malaria be followed by antisypilitic treatment on ordinary lines; the response to this is better after than before the fever. C. Richet, jun., and F. Joly²⁴ recommend that in primary and secondary cases the ordinary treatment be supplemented by pyrexial. For the purpose they give **Dmelcos**, the vaccine employed so successfully in the treatment of soft chancre. It is given intravenously in increasing doses on the same lines as in the treatment of chancroid.

TOXIC EFFECTS OF TREATMENT.—H. M. Cole and his colleagues²⁵ report an analysis of toxic effects in 1212 cases treated with arsenobenzene preparations. Amongst many points of interest they show a higher incidence of hæmorrhagic phenomena (purpura, hæmorrhagic encephalitis) in cases treated by the sulpharsphenamine group than in others. [This is Stokes's experience, and certainly seems to be supported by that of the V.D. Department, St. Thomas's Hospital. The incidence is not so great as to preclude the use of this type of compound (the only one practicable for subcutaneous injection), but it has to be kept in mind.—L. W. H.] The authors mention the good effects of **Liver Extract** in salvarsan dermatitis. [This is supported by other workers and can be substantiated by my own experience.—L. W. H.]

T. K. Lawless²⁶ recommends the following procedure in cases where some solution of an arsenobenzene preparation has accidentally been injected into the tissues outside the vein. The armlet of a blood-pressure apparatus is applied as high above the site as possible and inflated until the pulse at the wrist is abolished. From 10 to 20 c.c. of blood is withdrawn from a vein well below the site of the infiltration, and 10 c.c. of a solution of **Sodium Thiosulphate**

* J. C. Gables & Co. Ltd., 211, Blackfriars Road, London, E.C.4.

(1 grm. in 15 c.c. water) injected slowly into this vein. Then the armlet pressure is gradually relaxed and the remaining 5 c.c. thiosulphate solution injected.

Sensitization of the Skin by Arsenobenzene Preparations.—It has been shown by Frei, Salzberger, and others that the deposit of some solution of an arsenobenzene preparation in the skin (as may occur when some '914' solution is injected outside the vein) is apt to sensitize this so that a subsequent injection is more apt to result in a generalized dermatitis. A person who has once suffered from a salvarsan dermatitis may remain sensitized for a very long time, perhaps for the rest of his life, and in such cases further arsenobenzene treatment is contra-indicated. The problem is to decide in a patient who has once suffered from this form of dermatitis whether or not more treatment with arsenic can be given, and various skin tests have been devised to meet the difficulty. Amongst them is the 'patch test' (see MEDICAL ANNUAL, 1931, p. 459) in which a small piece of linen soaked in a solution of 0.3 grm. of '914' in 1 c.c. of water is applied to the skin (conveniently on the forearm), covered with waterproof tissue, and left for twenty-four hours. A positive reaction is shown by a patch of dermatitis with vesiculation in the area covered by the salvarsanized linen. Usually the reaction is apparent twenty-four hours after the application of the patch, but sometimes it is delayed for about two days. A. G. Schoch,²⁷ who has been a pioneer in the development of the patch test, reports some experiences which appear to show that the test is a safe guide. He also reports a case which shows that even a minute trace of solution of an arsenobenzene preparation left in a syringe may provoke a smart relapse of the original dermatitis in a subject giving a positive patch test.

F. Bernstein²⁸ describes experiments showing sensitization of the skin long after recovery from salvarsan dermatitis. The tests for sensitization were intracutaneous injection of myosalvarsan in strengths of 1.0 and 0.1 per cent and an application of 1.0 and 10 per cent solution respectively of sodium salvarsan (patch or percutaneous tests), to all of which the patient reacted. He showed also that the sensitization could be transmitted. From the sensitive subject of the above experiment 0.2 c.c. of blister fluid was injected intracutaneously into two normal subjects, and the injected areas were dressed with a 10 per cent solution of sodium salvarsan, with positive results. The author thinks that salvarsan dermatitis is not precipitated by the arsenobenzene compound as such, because usually by the time the dermatitis appears the amino-benzene portion of the compound has left the body, but small quantities of arsenic are left in the body, and it is this which is responsible. In support of this he found that the sensitized patient mentioned above responded to a patch test with Fowler's solution, though the reaction was much milder than that to an arsenobenzene preparation. The theory is that arsenobenzene preparations are the most powerful in producing a group sensitization which includes all forms of arsenic. The reaction is evoked most powerfully by arsenobenzene preparations and much less so by inorganic arsenic. [This would explain the fact that by no means all patients who have a paravenous infiltration develop dermatitis, some being sensitized more than others.—L. W. H.] The author suggests that a patient may be sensitized to arsenic by other means. Thus the patient who was the original subject of the above tests had suffered from psoriasis and been treated with Cignolin ointment, and he has described a case in which exposure to sun's rays seemed to have been responsible.

Jaundice.—H. Ruge²⁹ produces evidence to the effect that the incidence of jaundice in subjects under arsenical treatment for syphilis is closely parallel

with that in the general population. His conclusions are based on observation of nearly 2500 cases occurring in about ten years, and he shows graphs illustrating the almost parallel waves and depressions in the incidence of jaundice in the two classes. Both were small in the German Navy until 1917-18 (simple jaundice then 1.4 to 1.8 per 1000), but increased from 1920 to 1928, when the simple jaundice rate was 11.15 and the salvarsan 4.17. By 1929 the rates had fallen to 7.07 and 1.33 respectively. In the civil population the rate of simple jaundice also increased from 1919 to 1923 not only in Germany but also in such countries as Sweden, Norway, and the U.S.A. The civil rate was much smaller than the naval, owing, as the author thinks, to the greater opportunities in such congregations as the navy for transmission of bacterial infection. He reviews the various causes of salvarsan jaundice which have been cited by various authors—under-nourishment, poisoning by the benzene nucleus in arsenobenzene preparations, syphilitic disease of the liver, and so on—and rejects them, favouring the view that a bacterial agent is either entirely responsible or makes the liver more susceptible to the action of the arsenobenzene preparation. [It is interesting that in a table showing the incidence of salvarsan jaundice in cases treated by different types of arsenobenzene compounds it is far less (approximately one-third) in cases treated with sodium salvarsan than in those under neosalvarsan, whether used in conjunction with mercury or with bismuth. Sodium salvarsan does not seem to be greatly used in this country. It is the compound which results from the alkalization of '606' in making it ready for administration; it differs chiefly from this in the fact that it is sold in the form of the dry powder and is ready for administration on solution in water. In my experience, apart from a few small outbreaks of acute yellow atrophy in some military hospitals during the War, jaundice has occurred far less in cases treated with the original '606' than in those treated with '914'. Ruge's view that bacterial infection is to some extent responsible accords with the suggestion of the Salvarsan Committee of the Medical Research Council and of the late Dr. Stuart Macdonald that some other factor, possibly bacterial, may be at work in these cases.—L. W. H.]

Dermatoses from Bismuth Treatment.—E. A. Skolnik and I. Aleshire³⁰ report on 22 cases of skin disturbance in a series of cases which had received 25,000 injections of bismuth. Their dependence on bismuth seemed to be shown by (1) their development during bismuth treatment, (2) their subsidence on suspension of treatment, (3) their reappearance on its resumption. The great majority of the cases were erythemato-squamous, resembling pityriasis rosea, but some of them were pruritic and generalized, with a fine, horny folliculopapular eruption, while others were of a chronic lichenoid type. Usually the eruptions were not so severe as to prevent the continuance of the treatment.

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SYPHILIS, CARDIOVASCULAR. (See CARDIOVASCULAR SYPHILIS.)

SYPHILIS OF THE NERVOUS SYSTEM. (See NEUROSYPHILIS.)

SYRINGOMYELIA, SURGICAL TREATMENT OF.

Geoffrey Jefferson, M.S., F.R.C.S.

Tracey Putnam and D. Munro¹ discuss the surgery of syringomyelic cavities in the spinal cord by **Incision**. The paper is important because four carefully observed cases are reported, but in only one was there a remarkable improvement—the case of a young man 24 years of age. The other three cases were older (55, 55, 52); one was a complete failure, there was slight recovery in the other two. The authors describe the exact appearances of the cord and of the cavities as seen at operation. In all the cord was greatly swollen and seemed to fill the dural sac; the laminae appeared to be thinned by the pressure of the distended cord, and the extradural fat was absent. In one the fluid content of the cystic cord was yellowish, the walls of the cyst dark and discoloured. Actually the fluid within the cord did not contain an excess of albumin in the specimens tested (xanthochromic fluid case not included). The cord was incised in the mid-line over a length of 15.0 cm. in one case, the young man; the thin shell of cord then collapsed, lying in longitudinal folds within the enlarged spinal canal at the close of the session. Recovery was straightforward. In another case an incision almost as long was made, the cavity being followed up to the foramen magnum where it disappeared into the medulla. In another the cord incision extended for 12.0 cm. The problem presented is whether, in spite of the favourable opinion of Putnam and Munro, we ought to advise syringomyelic patients to have a myelotomy carried out. G. Ellmer,² of Tübingen, thinks if it is done at all it ought to be done early, to prevent the development of internal cord pressure changes of an irreparable nature. On the other hand, E. Koreiz³ thinks it should not be done at all, having had two failures himself.

We do not know what happens to these incisions into the cord, whether they remain open or whether they seal up again. Koreiz thinks that the only cases worth doing are the congenital syringomyelias, those in which the deficiency is all cavity with little surrounding gliosis. Putnam and Munro's cases would seem to bear this out, for their only really indisputably improved case was of that type. And because it seems that the operation is purely mechanical in its effects, those cases will be most suitable which have evidences of cord compression, the more so if the clinical signs or suggestions of it are borne out by observations on the spinal fluid dynamics (Queckenstedt's jugular compression test). It is easy to see that benefit will follow the wide incision of a cord which is so distended with fluid that the long conduction paths are pressed against the walls of the spinal canal. Contrarily, those cases where the changes are limited to sensory disturbances in the upper limbs, with some muscular atrophy in the hands and arms, but have no signs of compression of the cord as evidenced by disturbances of motion and sensation in the lower limbs, will not be suitable for operation—the less so, the older the patient. This is tantamount to repeating that the operation has no curative effect on the central cavity itself, but that the laminectomy, the long dural incision, the long cut in the cord, all tend to relieve compression. And, conversely, that the case with a considerable amount of central gliosis, a small cavity in its interior, and with no great pressure changes radiating outwards from this central lesion, is not a case for surgery. It remains for us to see whether we can distinguish these cases sufficiently clearly to be able to put precept into practice.

There remains to be added the fact that the mortality of these extensive cord incisions is very low (no deaths in a group of 45 cases operated upon by six different surgeons), so that no harm comes from the incision into the cord. This is important in that it will encourage physicians to refer to the surgeon more readily cases which seem to them to be suitable, cases which fulfil the criteria laid down above.

REFERENCES.—¹*New Eng. Jour. Med.* 1931, Oct., 757; ²*Der Chirurg*, 1931, iii, 260; ³*Nov. Chir. Arch.* 1930, xxi, 46.

TABES DORSALIS. (See NEUROSYPHILIS.)

TACHYCARDIA, PAROXYSMAL. (See ARRHYTHMIA.)

TALIPES.

E. W. Hey Groves, M.S., F.R.C.S.

In spite of all that has been said and done about the treatment of talipes equinovarus all those who are accustomed to deal with it are prepared to welcome suggestions for methods which will improve results. Two such

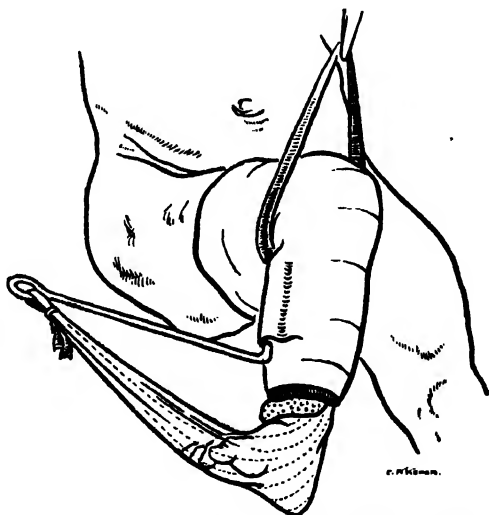


Fig. 81.—The 'stocking splint' for correcting talipes.

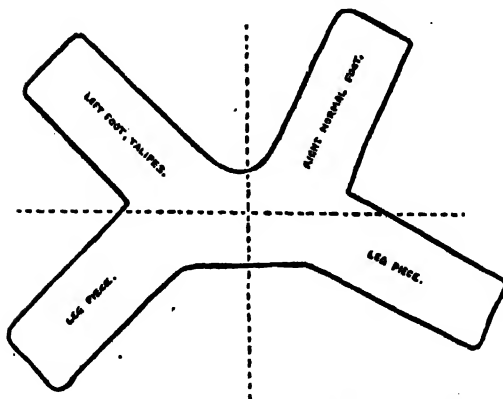


Fig. 82.—Hobble splint for moderate degree of left talipes, marked out on the flat.

methods are described by Denis Browne.¹¹ In the first of these the leg with the knee bent is encased in a plaster cast in which is incorporated a projecting steel strut the outer end of which lies in front of and to the outer side of the foot. When the deformity has been corrected by manipulation, the foot encased in stockinette is tied to the strut so as to maintain a constant pull

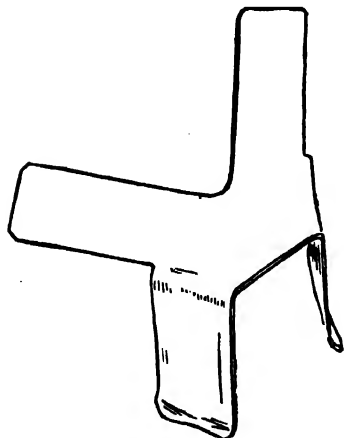


Fig. 83.—Hobble splint for double talipes, completed except for padding.

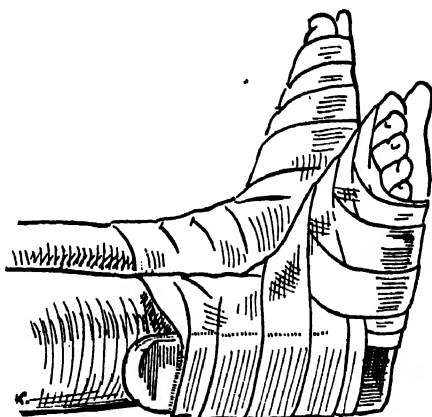


Fig. 84.—Hobble splint applied by figure-of-eight bandages.

(Figs. 81-84 by kind permission of the 'British Medical Journal'.)

outwards and upwards (Fig. 81). In the other method a double splint of aluminium sheeting is used so that each foot serves as a counter-support for the other. The method of making and applying this splint is seen in the accompanying figures (Figs. 82-84).

REFERENCE.—¹*Brit. Med. Jour.* 1931, Oct. 17, 696.

TESTICULAR HORMONE.

W. Langdon Brown, M.D., F.R.C.P.

J. Lorenzini¹ claims to have prepared the male hormone in a crystalline form analogous to theelin.

C. R. Moore,² in uttering a caution concerning orchitic therapy, states that he has never found potent doses of male hormone to stimulate activity in normal or damaged testes, but that on the contrary they have a retarding or injurious effect. The male hormone is produced only when the pituitary sex hormone is available, and in its absence the testes produce neither germ cells nor hormone. Clearly therefore in hypogonadism we should give the pituitary hormone and not testicular extracts.

L. L. Stanley,³ as a result of twelve years' experience, maintains that testicular transplants from rams has definite palliative results in hypogonadism. One ram supplied sufficient material for about twenty treatments.

REFERENCES.—¹*Presse méd.* 1932, March 26, 476; ²*Jour. Amer. Med. Assoc.* 1931, Aug. 22, 518; ³*Calif. and Western Med.* 1931, Dec., 411.

TESTIS, EPIDIDYMIS, AND SCROTUM, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Maldescended Testis (see also article TESTIS, UNDESCENDED).—Considerable light has been thrown upon the problem of why a maldescended testis becomes aspermatic if it is not contained in the scrotum. It is an established fact that if the maldescended organ is placed and maintained in the scrotum without

undue tension before puberty, its external secretory function is established; whereas if it is not contained in the scrotum, the function is never activated. O. H. Wangenstein¹ concurs with Moore that the reason for this is that the scrotum is a thermo-regulating mechanism.

The proper age at which to operate for maldescended testis is a moot point. If other things were equal, an operation performed at the age of 2 or 3 would undoubtedly give better results. First, compression of the testis for many years in the inguinal canal would be avoided, and the possibility of torsion would not arise. Furthermore, in these cases there is nearly always a hernial sac which is removed at the time of the operation. There are a number of papers²⁻⁴ upon this subject, mostly dealing with the technique of the operation of **Orchidopexy**. The variations of methods of retaining the testis in the scrotum are very numerous, and all appear to give creditable results. The most important factor in orchidopexy, is not the method by which the testis is retained in the scrotum, but rather the lack of tension upon the cord when the testis is replaced. The latter is largely dependent upon the thoroughness and extent of the dissection of the spermatic vessels from the retroperitoneal tissues and the peritoneum. P. LaRoque's⁵ method of gaining access to these vessels at a higher point than formerly is therefore of value. After opening the inguinal canal widely, he splits the internal oblique a little above the internal abdominal ring and reaches the vessels by the transperitoneal route.

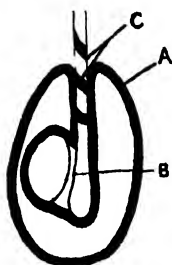


Fig. 85.—Diagrammatic representation of the predisposing causes of torsion of the spermatic cord. A Complete and high investment of the testis, epididymis, and cord by the tunica vaginalis; B, Testis and its adnexa hang in the vaginal cavity like a clapper of a bell; C, The cremaster muscle, which is attached spirally, when it contracts vigorously will readily cause rotation of the clapper (After Muschat)

Torsion of the Testis.—Torsion of the testis is better called 'torsion of the spermatic cord'. Torsion cannot occur in the completely normal organ. M. Muschat⁶ summarizes the predisposing factors of this condition diagrammatically (Fig. 85).

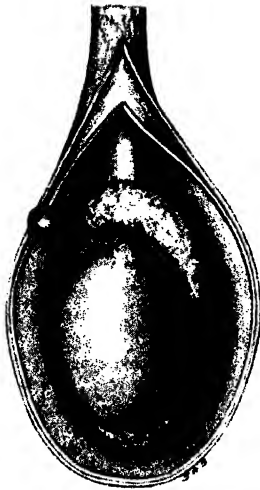
As a rule, within a space of a few hours, as a result of the torsion, the testis becomes irreparably damaged. Even in an example which was operated upon and in which untwisting was effected satisfactorily within one hour of the onset of the symptoms, the testis subsequently became completely atrophic. This, coupled with the fact that untwisting is often impossible, accounts for most cases being treated by orchidectomy.

Kenneth Walker⁷ met with a case of bilateral torsion in a boy of 15. The torsion occurred first upon one side, and in the space of four weeks upon the other. As a result of this experience Walker advises, as Keys suggested some years ago, that in cases of torsion of the spermatic cord an exploratory operation should be performed on the unaffected side, and if the factors which favour torsion (Fig. 85) are present the sac should be inverted and anchored to the back of the scrotum.

Torsion of Appendages of the Testis and Epididymis.—Vestigial structures related to the testis and epididymis—namely, the hydatids of Morgagni, the paradidymis or organ of Giralde's, and the vasa aberrantia—are liable to undergo axial rotation. The commonest of these structures to twist is the pedunculated hydatid (Plate XLVII). Colt reported the first case in 1922. V. W. Dix⁸ has collected forty-two cases reported in the literature up to the present time. Torsion of the appendages of the testis is essentially a lesion occurring before, or at the age of, puberty. No doubt many cases have escaped recognition and have been looked upon as examples of epididymo-orchitis of unknown

PLATE XLVII

TORSION OF HYDATID OF MORGAGNI



Torsion of the pedunculated hydatid of Morgagni. (*After Foster.*)

origin. Apart from the orchitis of mumps, acute epididymo-orchitis is of the utmost rarity in young boys, whereas torsion of the appendages of the testis cannot be so exceedingly unusual, for Mouchet in France, who has been interested in this condition for some years, has personally operated upon thirteen cases. Therefore, if a boy gives a history that one side of the scrotum has become swollen following a sudden attack of pain, providing the urine is normal and there is no suggestion of tuberculosis and no general disease such as mumps to cause acute orchitis, torsion of an appendage of the testis should at once occur to the mind of the diagnostician. Treated expectantly the affection runs a rather painful course, accompanied often by pyrexia, but resolution occurs eventually in all cases. Immediate operation with removal of the twisted appendage terminates the symptoms abruptly.

Hydrocele.—

Injection Treatment.—This ancient treatment has been revived, and variable results have been reported. A. E. Porritt,⁹ after tapping the hydrocele, washes out the sac with sterile water and introduces 5 c.c. of a 5 per cent solution of **Sodium Morrhuate**. A second tapping is necessary ten days later in most instances. The treatment is useless in old-standing hydroceles with thick walls. The injection treatment is not without danger. E. C. Dawson¹¹ records a case of a patient of 45 who one minute after sodium morrhuate had been introduced into the hydrocele sac complained of great pain in the abdomen. There was profuse sweating, the pulse became almost imperceptible, and the facies ashen grey. Morphine was required for forty-eight hours to relieve the pain.

Operative Treatment.—The two operations most generally practised are: (1) Eversion of the tunica, with posterior anchoring sutures (Jaboulay's operation); (2) Excision of the parietal layer of the tunica. The disadvantages of eversion are: (a) If the tunica is thick, a lump representing the turned back tunica persists behind the testis; and (b) Recurrence. Even after Jaboulay's operation has been carefully performed fluid occasionally accumulates in the everted sac.

Excision of the parietal tunica vaginalis is a more certain method of cure. Its main disadvantage is difficulty in obtaining complete hæmostasis, with the result that a troublesome scrotal hæmatoma too often occurs. This objection is completely overcome by excision with some form of **Cautery**. A. W. Moor¹² uses a Paquelin's cautery after clamps have been applied to the parietal layer in a circular manner as near the testicle as possible. The tunica is cut away with scissors and the raw surface seared with a thermo-cautery until nearly charred. Max Page¹³ uses a diathermy needle, and both operators have had an entire freedom from hæmatomata since adopting their respective measures of cautery excision.

Abdomino-scrotal Hydrocele.—S. F. Hurmann's¹⁴ patient was 26 years of age and the hydrocele extended into the abdomen. The condition is rare, the first case being reported by Richards in 1908 in an Egyptian.

Varicocele.—The **Injection Treatment** of varicocele is very successful. One treatment is all that is necessary in most cases. The reaction is often intense, but the result is never in doubt. The patient stands and the upper part of the scrotum is cleansed with alcohol. A small bunch of veins is taken up between the finger and thumb, and, using 2 c.c. of a 5 per cent solution of **Sodium Morrhuate** in a syringe armed with a particularly sharp needle, the injection is made from above downwards just below the external abdominal ring. The pampiniform plexus is entered at several points by a few short jabs of the needle. The patient then lies down and the puncture is sealed with collodion. A suspensory bandage is worn for some weeks. (A. E. Porritt.⁹)

Epididymitis.—Acute epididymitis, often but not necessarily gonococcal in origin, is the most frequent disease of the testicle and the most potent cause of male sterility (C. H. Garvin¹⁵). At the height of the attack the suffering is agonizing. M. Meltzen¹⁶ strongly recommends **Decapsulation of the Epididymis** in these cases. The testis is exposed by a vertical incision through the scrotum. The tunica vaginalis is opened and excised and the tense epididymis is seen. It is not punctured as in Hanger's operation, but is decorticated through a cruciform incision (Fig. 86). The scrotal wound is closed with drainage. Pain is abolished at once, the convalescence is rapid, chronicity avoided, and the chances of subsequent sterility are minimized. Meltzen is satisfied that the results of this operation are so good, that no one who tries it will return to the usual expectant treatment.



Fig. 86.—Incision for decapsulation of the epididymis.

Prevention of Post-operative Epididymo-orchitis.—B. Dumas¹⁷ has found that since vasoligature has been practised at his clinic, the incidence of epididymo-orchitis after prostatectomy has fallen from 33½ per cent to nil. The technique of the operation is simple and it can be performed under local anaesthesia. A towel clip placed as in Fig. 87 facilitates the isolation of the vas (H. Boeminghaus¹⁸).

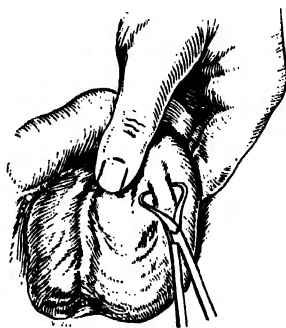


Fig. 87.—The vas deferens isolated and pressed against the skin by a towel clip. (Re-drawn from the 'Archiv für klinische Chirurgie'.)

J. Sarnoff¹⁹ draws attention to the ease with which the vasa can be picked up, divided, and ligatured during the course of a suprapubic cystostomy (Fig. 88), thus avoiding the necessity of performing a separate operation or of making special incisions for vasectomy. Division of the vas makes post-operative epididymo-orchitis impossible, but in a few cases (C. S. Swain,²⁰ H. Dodd²¹)



Fig. 88.—Method of delivering the vasa for ligation and division during the course of an operation for suprapubic cystostomy. (After Sarnoff.)

scrotal abscesses have formed around the proximal end of the divided and ligatured vas. This is a far less serious complication than epididymo-orchitis, and one which illustrates clearly how infection can and does pass from the prostatic bed to the testicle. Vasoligature is also indicated as a preliminary measure when trans-urethral resection of the prostate is contemplated. (*See also PROSTATE, SURGERY OF; SEMINAL VESICLES, SURGERY OF.*)

Malignant Testis.—Malignant disease of the testis is a comparatively rare affection, and it is the exception rather than the rule for the clinician to recognize it early. Maurice Chevassu's²² experience must be unique, for he has dealt with no fewer than 100 personal cases. His teaching should be known as widely as possible. It is this: if there is even the slightest enlargement of the *body* of the testis which cannot be clearly accounted for, the *organ* should be displayed to the light of day. Using local anaesthesia, the skin over the inguinal canal is infiltrated, and likewise the cord. This permits the testis to be delivered on to the surface without pain and practically no subsequent inconvenience to the patient. After the testis has been bared of its coverings, fully 90 per cent of even very early examples of malignant disease can be recognized at once. It is the *body* of the testis which is enlarged, a hardness can be detected on palpation, and the tunica albuginea is somewhat vascular instead of being dead white. If there is still doubt, the organ is incised. Using this method of ocular demonstration instead of groping in the dark, the otherwise difficult differential diagnosis of clotted haematocele is banished, and most cases of gummata can be recognized easily. The important point is that malignant disease is recognized early, and there can be little doubt that if, instead of waiting, the practice of displaying under local anaesthesia difficult testicular enlargements was adopted and taught in the British schools of medicine, the outlook in malignant testis would not be so gloomy. For practical purposes all neoplasms of the testicle are malignant, the teratomata being somewhat more malignant than the spheroidal-celled carcinomata. The lethal spread is via lymphatics. For this reason, simple castration is of little avail; it cures only 5 per cent of cases which are followed for four to six years. I. Simons²³ confirms the work of H. Dew²⁴ that the radical operation which removes the lymphatic field gives a considerably higher percentage of cures. Pre-operative and post-operative radiation appear to be of value.

Gynecomastia as a Complication of Malignant Testis.—L. Sas²⁵ reports the case of a man aged 24 years of age with a malignant testis. The breast became enlarged and colostrum-like fluid could be expressed therefrom.

Idiopathic Gangrene of the Scrotum (Fournier's Gangrene).—Idiopathic gangrene of the scrotum arises without apparent cause and the progress of the disease is always the same—first involvement of the scrotum, then extension along those planes so well known in urinary extravasation. The entire scrotal coverings slough, leaving the testes, bared to their tunica, hanging exposed though remarkably free from gangrene. In H. Brunn's²⁶ case the gangrenous portion of scrotum was excised and large incisions made into the infected inguinal region. **Potassium Permanganate** dressings were applied and irrigations of a 1-6000 solution of potassium permanganate were instituted at regular intervals through Dakin's tubes. Polyvalent anti-anaerobic **Serum** was also given. Under this treatment the infection subsided, and seven weeks later secondary suture was performed, after which the wounds healed per primam.

Elephantiasis of the Scrotum.—A most important consideration in removing enormous scrotal tumours is the position of the patient upon the operating table. He should lie horizontally with his legs hanging over the sides

of the table and his feet supported upon chairs (Fig. 89). This gives excellent exposure, allows the mass to be rolled, and at the same time obviates handling or lifting the scrotum. The

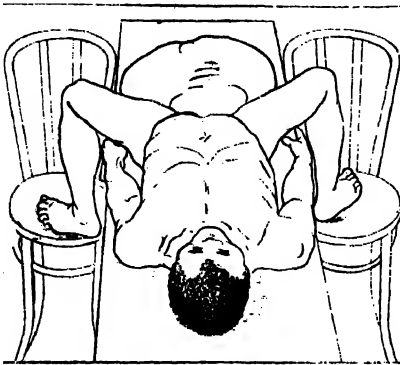


Fig. 89.—Position of the patient for the removal of an elephantiasis of the scrotum. Note the feet supported on chairs.

penis and testes are dissected out through an incision over the pubis and the operation is usually completed without cutting into elephantoid tissue. After the mass has been removed, the testes are accommodated one behind the other in the perineum and the bare shaft of the penis is skin-grafted. The latter is accomplished by the immediate application of Thiersch grafts. It is even better to place the penis in a tunnel under the skin of the abdomen or the thigh, the glans being brought out through a small incision. At a second operation under local anesthesia the penis is freed.

(J. I. Knott and B. R. Justus,²⁷ W. K. Connell.²⁸)

Carcinoma of the Scrotum.—A. Aspinall²⁹ records four cases. All the patients were firemen, stokers, or workers in kindred trades.

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1932, liv, 219; ²C. E. Farr, *Surg. Clin. of N. Amer.*, 1932, April, 327; ³H. Cabot and R. M. Nesbitt, *Arch. Surg.*, 1931, May, 850; ⁴F. Torek, *Ann. of Surg.* 1931, xciv, 314; ⁵*Ann. of Surg.* 1931, xciv, 314; ⁶*Surg. Gynecol. and Obst.* 1932, May, 758; *Internat. Clin.*, 1931, Dec., 253; ⁷*Brit. Jour. Urol.* 1931, 436; ⁸*Ibid.* 245; ⁹*St. Mary's Hosp. Gaz.* 1931, xxxvii, 75; ¹⁰*China Med. Jour.* 1931, xlv, 348; ¹¹*Brit. Med. Jour.* 1932, ii, 615; ¹²*Lancet*, 1931, ii, 680; ¹³*Brit. Med. Jour.* 1932, i, 658; ¹⁴*Jour. Amer. Med. Assoc.* 1931, xcviii, 399; ¹⁵*Amer. Jour. Surg.* 1931, xii, 502; ¹⁶*N.Y. State Jour. of Med.* 1931, xxxi, 903; ¹⁷*Jour. de l'Hôtel Dieu de Montréal*, 1932, i, 96; ¹⁸*Arch. f. klin. Chir.* 1931, Oct., 579; ¹⁹*Med. Times*, New York, 1932, 328; ²⁰*New Eng. Jour. Med.* 1931, Nov. 26, 1042; ²¹*Med. Press and Circ.* 1931, July 1, 10; ²²*Bull. et Mém. Soc. nat. de Chir.* 1932, April 19, 476; ²³*Amer. Jour. Surg.* 1932, Feb., 261; ²⁴*Ibid.* 1931, Aug., 15; ²⁵*Brit. Jour. Urol.* 1932, iii, 31; ²⁶*Surg. Clin. N. Amer.* 1931, xi, 929; ²⁷*Amer. Jour. Surg.* 1932, April, 78; ²⁸*Brit. Jour. Surg.* 1932, April, 651; ²⁹*Med. Jour. of Australia*, 1931, ii, 653.

TESTIS, UNDESCENDED. (See also previous article.)

John Fraser, Ch.M., F.R.C.S.Ed.

The subject of undescended testis often receives scant attention in surgical text-books, and one is apt to be left with the impression that the choice open to the surgeon lies between replacing the testis within the scrotum and, if this is impossible, removing the organ. As a matter of fact, the problem is one of many difficulties; its importance, in so far as it may concern questions of physical characteristics and sterility, is far-reaching; while there is evidence that surgeons are apt to be misled in regard to the acid test of ultimate result, for many cases which promise well at first prove disappointing when followed to a more final conclusion. It will repay us therefore to summarize what the literature of to-day has to say upon the question.

The origin of the disorder has never been satisfactorily explained. It was Hunter's view that the descent of the organ was incomplete because the structure of the testis was imperfect; more recently the work of Berry Hart and others indicated that there was an arrest in the descent owing to changes in the extra-gonad tissues. There are those to-day who hold that Hunter was right, and that an arrest in the complete development of the testicular tissues is the

PLATE XLVIII

OPERATION FOR UNDESCENDED TESTIS

OF, TORINO

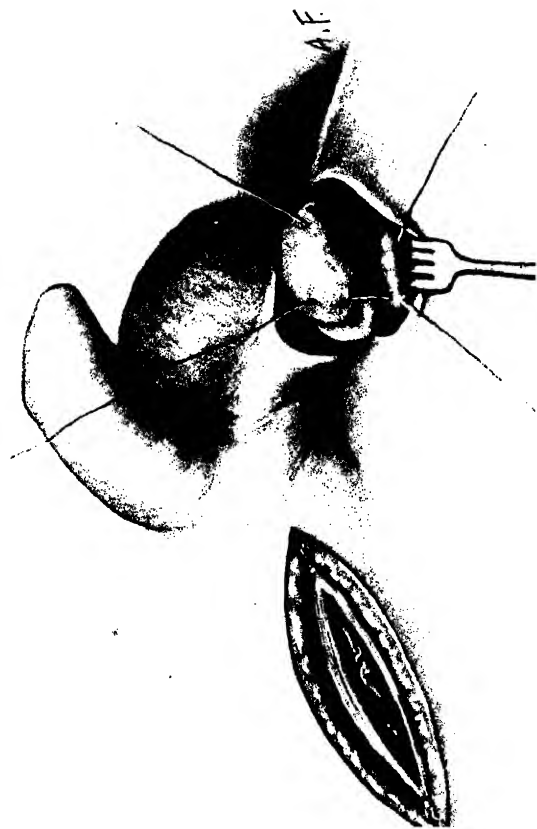


Fig. 1. The testis has been drawn down by the clasp, and two sutures have been inserted to fasten it to the fascia of the thigh.

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PLATE XLVIII 1. by kind permission of 'Annals of Surgery'

PLATE XLIX

OPERATION FOR UNDESCENDED TESTIS—continued

(F. TORLEK)

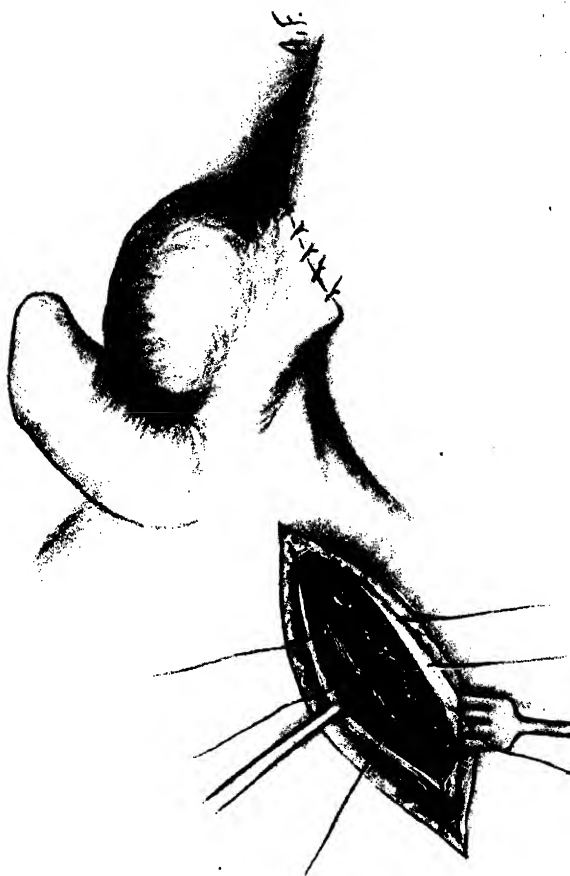
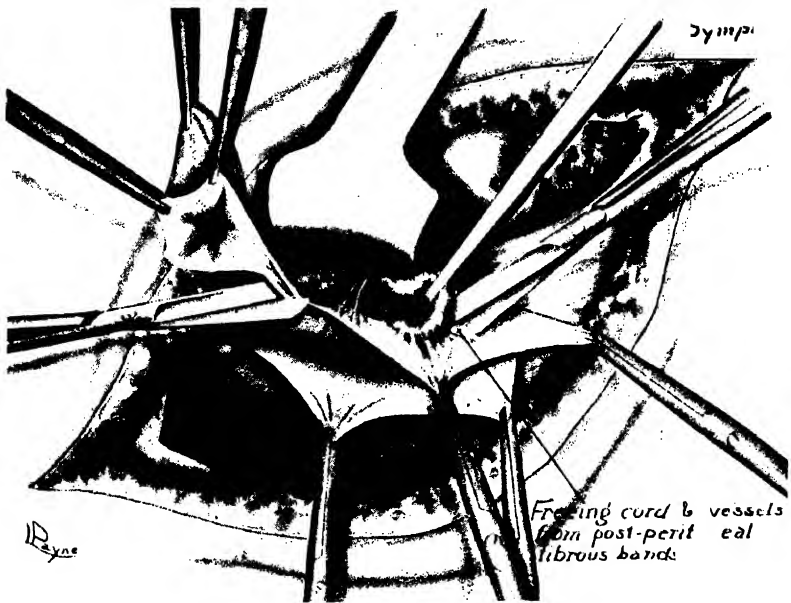


Fig. B. The testicle having been attached to the fascia, the skin is closed over it. B, the inguinal wound sutures have been passed through the internal oblique and transversus muscles above and Poupart's ligament below. The anastomosis of the external oblique is held back, above by a clamp, below by a retractor which partly conceals it.

PLATE L

OPERATION FOR UNDESCENDED TESTIS *continued*

(G. P. LAROCHE)



The vas deferens held up shows the strong but delicate fibrous bands in the peritoneum. The bands are being divided by a sharp knife, so as to free the vessels at the highest possible point, making it possible to pull down the four inches.

it against the vas and three or

primary factor, and that changes in the surrounding tissues are but secondary to the glandular hypoplasia.

The histology of *ectopic testis* is discussed by A. Botto-Micca.¹ He brings out that, while there is considerable variability in the degree and the nature of the cellular hypoplasia, the general fact may be stated that the higher the position of the testis, the more serious is the cellular disturbance. It is further evident that the spermatogenic cells, including the basement cells of Sertoli, are those more especially affected, but in a certain proportion of cases there is a degeneration of the interstitial cells accompanied by a round-celled infiltration of obscure origin.

TREATMENT.—Treatment is fully considered in a paper by O. H. Wangenstein.² It is evident that there is now a consensus of opinion in favour of the operation of temporarily attaching the scrotum and testis to the tissues of the thigh on the same side, and it is clear that this method is preferable to any means of artificial traction or support. It is remarkable that no disability or discomfort appears to be associated with the fixation, and in many cases an interval of as long as two-and-a-half years elapsed before separation was carried out.

The operation was originally described by F. Torek,³ and he contributes an account of the operation he favours and practises. It is essentially similar to that which he described in 1909; it consists in the division of all shortened structures of the cord with the exception of the ductus deferens and the spermatic vessels, and the implantation of the testis into the scrotum, the scrotum with testis being afterwards anchored to the thigh tissues on the same side. The more essential details are shown in *Plates XLVIII, XLIX*.

Whatever method of fixation may be adopted, the procedure of efficiently mobilizing the testis while still preserving the blood-supply is one of the most important details of the operation, and G. P. LaRoque⁴ suggests that very complete mobilization may be secured by a transperitoneal operation. This implies opening the peritoneum at the internal abdominal ring, and at this point dissecting the ductus deferens and the spermatic plexus of vessels from their attachments to the peritoneum. There is no doubt that by this method a wonderful degree of laxity is secured, and the prospects of a successful operation thereby improved (*Plate L*).

End-results after Operation.—This issue is discussed by W. Gerlach.⁵ He recounts the results of 34 cases as observed over a considerable period of time from a minimum of eighteen months to a maximum of fourteen years in certain cases. Attention is drawn to the constant tendency to retraction, even when all structures of the cord are divided with the exception of the ductus deferens and the spermatic vessels, and to avoid this tendency some method of fixation is essential. If the details of gaining efficient mobilization of the testis, of retaining an efficient blood-supply, and of suitably securing the testis in its new situation are observed, the results of the operation are most satisfactory. If atrophy of the testis occurs, it is the result of undue interference with the blood-supply, or such a measure of retraction subsequent to the operation that pressure continues to be exerted upon the testis. Unless atrophy ensues there is every likelihood that the secretory function of the organ will be normal.

COMPLICATIONS.—An important question which often forms the basis of argument and discussion concerns the *liability of an ectopic testis to become malignant*. This matter is discussed by Wangenstein,² who has no doubt that the undescended testis is more likely to become malignant than the normally descended one. Cunningham in 1921 found that in 452 cases of malignant testis 40 concerned the undescended organ. When it is remembered, however, that only 1 patient in 500 possesses an undescended testis, it would seem

apparent that malignancy in so far as it affects the undescended testis is fifty times more common than the similar disease affecting the normal organ.

The other complication likely to arise is that of *torsion*, and there is no doubt that this disturbance is unduly common in cases of *ectopia* or undescended testis.

REFERENCES.—¹*Policlínico*, 1931, xxxviii, No. 30, 1065; ²*Surg. Gynecol. and Obst.* 1932, Feb., 219; ³*Ann. of Surg.* 1931, July, 97; ⁴*Ibid.* Aug., 314; ⁵*Deut. Zeits. f. Chir.* 1931, Oct., 552.

THALLIUM POISONING. (See also SKIN, FUNGUS AFFECTIONS OF.)

Macdonald Critchley, M.D., F.R.C.P.

H. M. Ginsburg and C. E. Nixon¹ have recently recorded 11 cases of thallium poisoning due to the ingestion of 'Tortilla'—a Mexican bread made from barley—with which thallium had been mixed for the purpose of killing rats. Twenty-four hours after taking the bread, paræsthesiæ and pains appeared in the hands and feet, followed shortly afterwards by bouts of intense abdominal pain and vomiting. There was no diarrhœa. After a time weakness developed in the limbs, more especially in the distal segments. Stomatitis, salivation, fœtor, and purplish discoloration on the gums were present in a number of the cases. At times the lips showed vesicles. At this stage the urine contained albumin and hyaline casts. From the second to the fifth day cerebral symptoms supervened, consisting in cranial nerve palsies, delirium, and involuntary movements of a choreiform or myoclonic character. Ptosis, mydriasis, and strabismus were commonly present. At this time the hair fell out. The state of the deep reflexes was very variable. In the severer cases epileptiform attacks occurred, leading to delirium, coma, and fatal respiratory failure.

Milder symptoms occurred after a delay of some months in 2 cases of thallium poisoning due to the use of depilatory creams, reported by W. L. Lillie and H. C. Parker.² Pains, dysæsthesiæ, and weakness in the limbs were followed by acute bilateral retrobulbar optic neuritis. Under treatment, some restoration of visual function took place.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, xcvi, 1076; ²*Ibid.* 1347.

THROMBO-ANGITIS OBLITERANS. (See also SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.)

A. G. Gibson, M.D., F.R.C.P.

N. W. Barker¹ gives the results of his treatment of thrombo-angiitis obliterans by the method of protein shock. He gives a **Vaccine** of *B. typhosus* and *B. paratyphosus* A and B, with an initial dose of 15 to 30 million organisms. The number of injections depends on the response as judged by the relief of pain and healing. In addition to the relief of pain it increases the blood-supply to the extremities, but it has little effect in cases in which there is claudication or extensive gangrene. The best results are obtained when there is pain at rest with or without ulcers.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1931, Sept. 19, 841.

THYMIC GROWTHS. (See LUNGS AND MEDIASTINUM, PRIMARY GROWTHS OF.)

THYROGLOSSAL FISTULA.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Hamilton Bailey¹ states that in an adult it is usually a simple matter to tell at a glance if a thyroglossal fistula is an old-standing one. Fistulas originating during infancy have their orifices situated low down in the neck. Furthermore, the crescentic appearance of an old fistula is characteristic (*Plate LI, Fig. A*). The duct can sometimes be shown after injecting lipiodol to pass

PLATE LI

THYROGLOSSAL FISTULA

(HAMILTON BAILEY)

HYOID

TRACT

**CRESCENTIC
FOLD**

**COAGULATED
EXCRETION**

MANUBRIUM

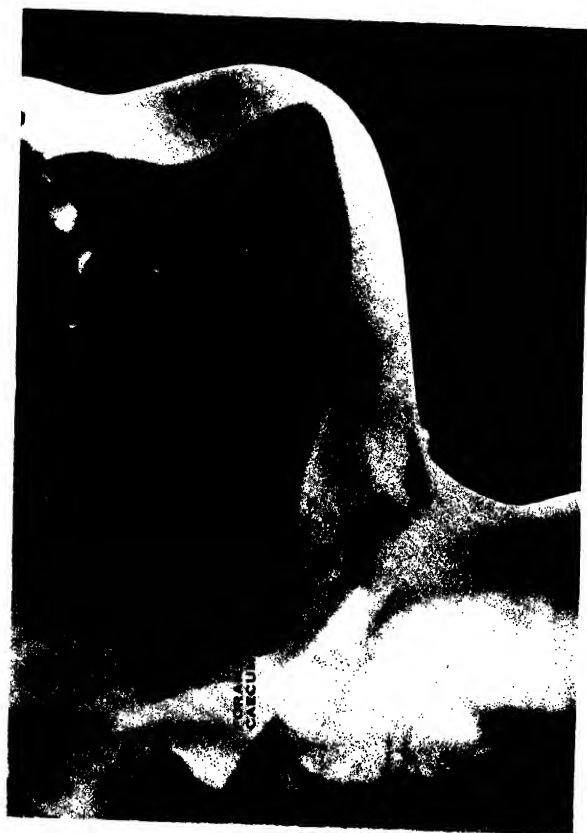


Fig. 4. A long-standing thyroglossal isthmus. The crescentic fold is characteristic.

Fig. 5. Lateral radiogram after an injection of lipiodol into a thyroglossal isthmus. The track passes up to the foramen caecum. (Lithiogram by Dr. H. A. Cooke.)

right into the back of the tongue (*Plate LI, Fig. B*). Unless the entire tract is removed, secreting epithelium is left behind and the fistula reappears. In a review of thirty cases of thyroglossal fistula, seventeen followed an operation for a thyroglossal cyst.

Radical Operation.—Through an elliptical transverse incision about the orifice, the tract is dissected up to the level of the hyoid bone. There is nothing to disturb the even tenor of the dissection up to this point. The body of the hyoid bone is then cleared on either side and divided on the left and the right so as to free a little more than a quarter of an inch of the centre of the bone, to which the tract is attached. Incidentally, even in a child, the hyoid is a tough little bone, and full-sized bone-cutting forceps are necessary to divide it cleanly. The wedge out of the hyoid is lifted up and the thyrohyoid membrane displayed. Dissection is now continued in the direction of the foramen cæcum, but this time without attempting to isolate the duct (*Plate LII*). The tissues are cored through, allowing about a third of an inch on every side of the duct. The foramen cæcum lies upwards and backwards at an angle of 45° from the body of the hyoid bone, and it is along this line that we proceed until the cavity of the mouth is reached. This completes the dissection, and one lifts away *en bloc*—the skin about the orifice of the tract; the tract as far as the hyoid bone; the centre of the body of the hyoid bone; a disk of muscle from the mylohyoid muscle; a disk of muscle from the geniohyoid muscles; a tubular portion of the very heart of the geniohyoglossi muscles; and the foramen cæcum.

Within this vermiform length of tissues, a seemingly sorry prize for so much labour, lies every secreting cell of the thyroglossal tract. Nothing short of this radical extirpation will guard against recurrence.

¹REFERENCE.—*Brit. Med. Jour.* 1931, ii, 138.

THYROID GLAND, DISEASES OF. *W. Langdon Brown, M.D., F.R.C.P.*

GOITRE.

In an elaborate monograph, entitled *The Life Line of the Thyroid Gland*, Colonel McCarrison and Professor Madhava make an exhaustive study of certain problems of goitre. The classical type of endemic goitre occurs in mountainous regions, such as the Alps and Himalayas, in association with cretinism, deaf-mutism, and various degrees of physical and mental deterioration. They would favour the restriction of the term 'endemic goitre' to this type. Its incidence is low in childhood and tends to increase steadily as life goes on, reaching its maximum between 40 and 60. The second type is the diffuse colloid goitre of the plains, met with in certain lowland districts of England, America, and the Netherlands, and rarely if ever associated with cretinism and deaf-mutism. Its incidence rises rapidly in childhood, attaining its maximum at puberty and declining after 25. A more persistent variety of this type is met with in New Zealand. A special 'childhood goitre' they are inclined to regard as almost physiological. Finally there are sporadic cases of non-toxic goitre. The incidence curves of these different types vary so widely as to make it improbable they have the same etiology.

The thyroid has a definite life line, which has a relatively rapid rise prior to puberty, declining gradually as age advances. It is so open to examination that physiological changes are often mistaken for pathological ones. They classify goitrogenic influences first under faults in diet: (1) Excess of fats and lime; (2) Deficiency of vitamins A and, possibly, B, iodine, and phosphates; (3) Positive goitre-producing substances, among which they include cabbage, groundnuts, bran, and maize. Second they rank insanitary conditions

involving contamination of food and drink by excreta. Iodine insufficiency they place next in importance, but they maintain that the lymphadenoid goitre can arise despite adequate ingestion of iodine. In addition to correction of these untoward general factors, they regard **Sodium Phosphate** as effective against the action of excess of lime in the diet, **Thymol** in cases dependent on intestinal toxæmia, and **Manganese Chloride** in lymphadenoid goitre.

J. W. Hinton¹ maintains that from a clinical point of view it would be much simpler for us to regard the different goitres as a continuous disease process and treat all cases medically unless hyperthyroidism, pressure symptoms, or an encapsulated tumour actually exists.

O. P. Kimball² again claims that the administration of **Iodized Salt** has proved an outstanding achievement in preventive medicine by leading to the disappearance of endemic goitre in school children throughout Michigan, and is reducing the incidence of feeble-mindedness. K. D. Fairley³ writes with equal enthusiasm as to the effects of 1 part of potassium iodide in 250,000 parts of salt in preventing goitre in the school children of Australia. Five mgrm. of iodine each week is effective and harmless.

(See also HEART IN GOITRE.)

HYPERTHYROIDISM.

Although many papers on various aspects of hyperthyroidism have appeared, there is little that is new; nor need this be regretted, since most of the work done is confirmatory of the pathology and treatment that have become generally agreed upon in the last ten years.

ETIOLOGY AND PATHOLOGY.—A. Jordi,⁴ using the biology test for activity of goitres—namely, their influence in accelerating metamorphosis in tadpoles—finds considerable variation in the correlation between iodine and colloid content and biological activity, when different geographical areas are studied. He considers that in cases of primary Graves' disease treated by iodine, evidently not all of it was present in an active form. In many forms of goitre a dysfunction due to change in the quality rather than the quantity of thyroid secretion seems to exist.

W. S. Reveno,⁵ developing McCarrison's views on the effects of toxic material in the intestines on the thyroid, attributes the disease to a faulty and irregular metabolism of tyrosin, which is now known to be the basis of thyroxin.

W. A. Plummer and C. Mayo⁶ are sceptical of infective processes or surgical operations as causes of Graves' disease. They regard them as merely precipitating a tendency already existing.

H. B. Friedgood⁷ puts forward the somewhat remarkable hypothesis that there is a close association between Graves' disease and chronic lymphatic leukaemia, and that both are benefited by **Lugol's Solution**. He regards them as both due to some disturbance of the sympathetic nervous system and refers the effect of iodine to its action on this system. It is interesting to find that the basal metabolic rate is increased in both.

SIGNS AND SYMPTOMS.—J. R. Verbruycke⁸ reports 34 cases of masked hyperthyroidism in which gastro-intestinal symptoms were the only ones complained of. Treatment directed towards the thyroid rapidly cleared up the digestive symptoms.

H. J. Van den Berg⁹ calls attention to disturbances of handwriting as an early indication of hyperthyroidism.

H. F. Dunlap and E. J. Kepler¹⁰ report 4 cases of patients at the Mayo Clinic suffering from Graves' disease who were subject to attacks clinically identical with the syndrome known as 'familial periodical paralysis'. In each

case the attacks ceased when the primary disease was controlled by medical or surgical measures. This is interesting in view of the suggestion already made that this form of paralysis is due to an endocrine disturbance affecting muscle tissue.

Creatinuria was first observed to occur in hyperthyroidism by Shaffer in 1907. It is presumably connected with the muscular wasting. E. J. Kepler and W. M. Boothby¹¹ confirm its occurrence, as well as Palmer's observation that the administration of iodine checks it. They do not regard this as a specific effect but as an index in the improvement of the patient's general condition.

COMPLICATIONS: THYROID CRISES.—E. I. and J. M. Greene,¹² emphasizing the fact that a thyroid crisis is one of the most serious complications of hyperthyroidism, note that it may occur as the result of physical fatigue, psychical stimulation, intercurrent infection, or a trivial surgical condition. Its appearance after operation is best prevented by adequate pre-operative therapy. If not recognized early and treated immediately by iodine, fluids, glucose, and morphine, death will frequently result. It may be remarked that severe cases are apparently more frequent in America than in England.

TREATMENT.—R. D. Mussey and W. A. Plummer¹³ adduce evidence that the modern treatment of hyperthyroidism by **Operation and Iodine** now enables pregnancy to be carried through with reasonable expectancy of health and of normal living offspring.

C. H. Frazier¹⁴ concludes that free iodine, in order to be absorbed, must be converted into an iodide and that it is unnecessary to have it 'loosely combined', to which quality has been ascribed the effect of Lugol's solution on hyperthyroidism. He therefore gives **Potassium Iodide**. Nevertheless there is a body of clinical opinion in favour of giving iodine without any iodide at all, as less likely to cause iodism.

F. R. Fraser,¹⁵ reviewing the experience of the last ten years, is in favour of the continuous administration of **Iodine** in toxic goitre and not simply as a pre-operative measure [with which I cordially agree.—W. L. B.]. It must be admitted, however, as urged by W. O. and P. K. Thompson,¹⁶ that during prolonged continuous administration of iodine, more or less refractoriness to the drug may develop, which calls for its omission. This refractoriness disappears within twenty-four days. In conjunction with A. C. Cohen, these authors¹⁷ demonstrate that iodine must be administered at a certain minimum rate, about 6 mgrm. a day, in order for the maximum effect to be produced.

Whereas Fraser would restrict **Radiation Therapy** to cases which are still mild and where a skilled surgeon is not available, J. Thompson Stevens¹⁸ regards this method of treatment as second to none. He actually claims 85 to 90 per cent of cures.

Israel Bram¹⁹ again calls attention to the great value of **Quinine** in exophthalmic goitre. It is well tolerated, and can be given without danger of producing an exacerbation. Unlike iodine it does not produce any marked enlargement, and while it is slower in producing beneficial effects, the results are continuous and cumulative. **Quinine and Iodine** may complement each other in treatment, and when combined the risks attending prolonged iodine administration are avoided. [The reviewer warmly agrees with this; quinine given as the hydrobromide is in his opinion a valuable drug in conjunction with iodine, and its use is much neglected in this country.]

M. Loeper, P. Soulié, and E. Bioy²⁰ recommend **Borax** in the treatment of Graves' disease, especially for the nervous symptoms. They give approximately 3 gr. with an equal amount of **Citrate of Soda** twice or thrice daily.

L. Goldemberg³¹ speaks well of the effect of **Sodium Fluoride**. W. Orlowski³² regards both borax and fluorides as mere adjuvants which cannot replace the classical methods.

Israel Bram,³³ utilizing the stimulating action of **Physostigmine** on the cardiac endings of the vagus, claims that it is a valuable drug in the treatment of hyperthyroidism. He gives $\frac{1}{60}$ to $\frac{1}{10}$ gr. three times a day, depending on the weight of the patient.

HYPOTHYROIDISM.

H. C. Barlow³⁴ makes a plea for the earlier recognition of thyroid deficiency, based on his own experience as a patient. Its possibility should always be borne in mind in cases of vague symptoms such as lethargy, a feeling of cold, myalgia, failing memory, and altered voice. [The profession is permanently indebted to Hertoghe for his insistence on this very point, and it is the reviewer's experience that minor degrees of hypothyroidism are frequently overlooked and great discomforts which could easily be remedied are allowed to continue.]

J. W. Hinton³⁵ calls attention to abdominal pain as a symptom of hypothyroidism and advises treatment by **Thyroid Extract** or **Thyroxin** when X rays and chemical examinations reveal no cause and the basal metabolic rate is subnormal. T. R. Brown³⁶ also stresses the effect of hypothyroidism on gastro-intestinal function, particularly in causing obstinate constipation.

THYROID MEDICATION.

H. Gardiner Hill,³⁷ protesting against the frequent misuse of thyroid extract in the treatment of various conditions, stresses the value of radiographic examination of the bones. Delay in the appearance of centres of ossification, a disproportional dwarfism, the limbs being too short for the trunk, are indications for treatment by thyroid extract. Omission to give it is very liable to lead to indefinite delay in the establishment of puberty. He considers that mental backwardness is less amenable to treatment than physical. He again calls attention to the important fact that when thyroid deficiency occurs after puberty it is more liable to cause menorrhagia than amenorrhœa. [Failure to recognize this fact has in the reviewer's experience led to mistakes in diagnosis.] In conjunction with Forest Smith he has found thyroid extract useful in sterility and repeated miscarriages. A low basal metabolic rate in obesity is the chief indication for treatment by thyroid extract. In endogenous obesity satisfactory results can only be obtained by combining thyroid with dieting. As to arthritis, he believes that results are only obtainable by thyroid medication in the quiescent stage and when other stigmata of hypothyroidism are present, but that osteo-arthritis in obese patients at the climacteric is more amenable if treated early. Synthetic thyroxin in his opinion has no advantage over thyroideum siccum, with which he starts by giving $\frac{1}{2}$ gr. daily, increasing by $\frac{1}{2}$ -gr. steps weekly or fortnightly, the optimum dose for frank myxœdema being from $1\frac{1}{2}$ to 2 gr. a day. He distinguishes between simple overdosage and a thyrotoxæmia, which is much more serious and more lasting. This complication generally arises from taking thyroid during an infective illness or in the presence of a septic focus. Shock, operative or psychic, or irradiation of the ovaries, may also be exciting causes, and thyroid administration should therefore be avoided under such conditions.

M. M. Lévy and E. Lévy³⁸ find that thyroxin will reduce excess of cholesterol in the blood to normal if given intravenously twice or thrice weekly until 6 mgrm. have been given in all, no individual dose to exceed 1 mgrm. If the

PLATE LIII

LINGUAL THYROID

(H. P. ULRICH)



A. Drawing showing tumour as it appeared on examination at direct laryngoscopic examination showing relation of sagittal section showing relation of tumour.

of mouth. B. Appearance of piglottis. C. Schematic drawing

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cholesterolemia tends to increase again, they recommend the oral administration of 10 to 15 mgrm. distributed over eight to ten days. Presumably from Gardiner Hill's experience a similar result could be obtained, and more safely, from thyroideum siccum.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1932, April, 563; ²*Jour. Amer. Med. Assoc.* 1931, Dec. 19, 1877; ³*Med. Jour. of Australia*, 1931, Nov. 28, 681; ⁴*Arch. of Internal Med.* 1932, April, 541; ⁵*Ibid.* 1931, Oct. 592; ⁶*Surg. Gynecol. and Obst.* 1931, Dec., 721; ⁷*Amer. Jour. Med. Sci.* 1932, April, 515, June, 841; ⁸*Jour. Amer. Med. Assoc.* 1931, Aug. 22, 513; ⁹*Amer. Jour. Med. Sci.* 1931, July, 114; ¹⁰*Endocrinology*, 1931, 541; ¹¹*Amer. Jour. Med. Sci.* 1931, Oct., 476; ¹²*Ann. of Surg.* 1932, April, 537; ¹³*Jour. Amer. Med. Assoc.* 1931, Aug. 29, 602; ¹⁴*Ann. of Surg.* 1932, April, 517; ¹⁵*Brit. Med. Jour.* 1931, II, 739; ¹⁶*Arch. of Internal Med.* 1931, Sept., 351; ¹⁷*Ibid.* 1932, Feb., 198; ¹⁸*Jour. Amer. Med. Assoc.* 1931, Dec. 5, 1689; ¹⁹*Ibid.* 1932, June 18, 2246; ²⁰*Presse méd.* 1932, June 29, 1013; ²¹*Jour. Amer. Med. Assoc.* 1932, Feb. 27, 775; ²²*Presse méd.* 1932, May, 836; ²³*Arch. of Internal Med.* 1931, July, 126; ²⁴*Practitioner*, 1931, Dec., 648; ²⁵*Jour. Amer. Med. Assoc.* 1932, May 14, 1702; ²⁶*Ibid.* 1931, Aug. 22, 511; ²⁷*Practitioner*, 1931, Dec., 662; ²⁸*Presse méd.* 1932, Feb. 13, 240.

THYROID SURGERY. (See also PARATHYROID TUMOURS.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

Lingual Thyroid (Plate LIII).—H. F. Ulrich¹ quotes Cattell as saying that "The least frequent of all aberrant locations of the thyroid is the lingual". Only two cases had been encountered in 7600 operations on the thyroid at the Lahey Clinic. In all, there are approximately 100 cases in the literature.

When a lingual thyroid attains such size as to produce urgent dyspnoea and dysphagia, active treatment is indicated. In the young **Tracheotomy** should be the first step. The tracheotomy incision should be large enough to determine whether there is any normally situated thyroid. The electro-surgical knife will greatly facilitate the extirpation of the lingual thyroid. Ulrich advises a policy of watchful waiting in cases with mild symptoms, especially if no other thyroid tissue is demonstrable.

Hyperthyroidism.—G. Crile² contributes an article on hyperthyroidism, which we summarize below.

SYMPTOMS AND SIGNS.—In the thyroid subjects prior to the degenerative stage there is seen an abnormally good memory and the power of sustained attention. In almost every history it will be shown that high scholastic standards are attained with apparently little effort. Emotionalism is a prominent symptom. The emotions are easily aroused, running an intense course and ending abruptly.

As a corollary there are irritability, quick responses, and high-speed activity. Usually, there is no complaint of pain. Just as in the state of aroused emotion in the normal person no pain usually is recognized. The patient with hyperthyroidism has the feeling that everyone about her is too slow—and this becomes an added annoyance.

Special Senses.—All the special senses—seeing, hearing, touch, pain—are highly stepped-up in acuity. There is a subjective feeling of warmth, as also an intolerance to external heat.

The Skin.—The skin shows continuously the changes noted in the normal subject when under a major emotion. It is soft, moist, warm, pliable, and vascular.

The Face.—The lines are deeply engraved. There may be cedema of the sockets, the eyes are staring, exhibiting exophthalmos and dilatation of the pupils. The mouth is restless and sensitive. The entire facial picture gives the impression of a perspiring, flushed, excited, and fatigued emotional state.

The Teeth.—The altered secretion of the mouth, the trembling tongue, the tendency to dental decay—all seem to be of the order seen in the long-drawn-out emotional distress incident to strain caused by sickness and death in family life.

The Lungs.—The increased respiratory exchange is a consequence of increased metabolism. The patient with hyperthyroidism is breathless even during conversation, and in some instances his vital lung capacity is lowered.

Cardiovascular System.—An interesting corollary to the stepped-up efficiency of the heart-nerve-muscle mechanism, is the extraordinarily prolonged, excessive heart action without heart failure. It is a striking fact that a heart so long overtaxed unceasingly day and night can be so tenacious. It would seem that while the thyroid's hyperactivity drives the heart excessively it equally increases its efficiency to perform its task.

TREATMENT.—Crile emphasizes the fact that **Thyroidectomy** is the treatment of choice in the presence of evident hyperthyroidism. In mild cases, a carefully controlled hygienic regimen, in which rest is the predominant feature, may effect a cure. Crile removes the thyroid by his own well-known technique: (1) The operation is performed in the patient's room with gas-oxygen anaesthesia, supplemented by novocain infiltration; (2) The usual collar incision through the skin; (3) The skin-flaps are reflected, leaving the undivided platysma behind. This muscle and the underlying sternohyoid and sternothyroid are divided by a long vertical incision in the anterior mid-line. Crile believes that the most common direct cause of abductor paralysis of the vocal cords is the pull on the nerve which may occur when rolling out the goitre. The pull may cause partial and temporary, or complete and permanent, paralysis. He emphasizes the difficulty of recognizing the parathyroids. They are usually protected by the posterior lateral portion of the thyroid gland, but occasionally may occur on the anterior aspect. When performing thyroidectomy, if both lobes are of about the same size, adherent and set deeply in the lateral aspect of the neck, the mode of attack is by a vertical division of the gland in the mid-line, the division being carried to a point just short of the rings of the trachea and the laryngeal box. Then, with accurate hæmostasis the attachments of the goitre to the trachea and larynx are caught and divided point by point, the division including the attachments of both the upper and lower pole. After one lobe is excised, the hæmostats are tied off.

If the goitre is retrolaryngeal, then when its attachment to the larynx is completely severed, the retrolaryngeal portion will slide out almost without aid and the voice will not even be changed in pitch. If the goitre is substernal, the process of delivery resembles the laying of an egg. If the goitre is behind the trachea, it is easily drawn out; it matters little into what recesses the goitre has thrust itself: once its attachment to the larynx has been divided it will tend to extract itself because of the severing of this attachment and the release of the pressure.

Protection of the Nerve against Scar Formation.—The posterior margin of the thyroid, that part lying between the capsule and the nerve, is 'no-man's-land'. It is not palpated; it is subjected to the least possible traction, and no division of tissue is made, so that no paralysing scar can form during the healing of the wound. By these precautions temporary and permanent injury of the recurrent nerve may be completely eliminated, except in the occasional case in which a technical emergency arises.

Amount of Thyroid to Leave.—How much thyroid tissue should be left? From the standpoint of end-results the surgeon must steer a difficult course between the Scylla of myxœdema and the Charybdis of failure to cure the disease. The most permanently satisfactory results are secured in the cases in

which such an amount of thyroid tissue is removed as to produce a temporary, mild hypothyroidism, which is characterized by a gain in weight, a slight feeling of coldness in the extremities, some dryness of the skin, and subnormal reaction to ordinary excitation—that is, the condition which is associated with a slightly subnormal basal rate. When this condition follows the thyroidectomy the patient usually passes through a definite cycle, with progressively increasing weight for from four to six months, then gradually losing weight until the pre-goitre normal is regained.

F. H. Lahey³ in discussing the question of how much thyroid tissue should be removed in *toxic goitre*, states that up to recent years one heard a good deal about the need of leaving a layer of thyroid tissue of the isthmus over the trachea. He believes that this is not necessary and tends to result in inadequate removals of thyroid tissue. He recommends that the isthmus should be removed in all thyroidectomies for toxic goitre. Care should be taken not to remove too much thyroid tissue for hyperthyroidism in children, owing to the danger of myxœdema.

Thyroiditis.—H. M. Clute and F. H. Lahey⁴ discuss thyroiditis, and come to the following conclusions: (1) Acute thyroiditis rarely occurs as a serious prostrating condition. It occasionally progresses to abscess formation and requires adequate exposure and adequate drainage. (2) Syphilitic thyroiditis occurs as a diffuse thyroiditis or as a nodular gummatous thyroiditis. It is cured by antisyphilitic treatment. (3) Tuberculous thyroiditis is found occasionally on microscopical examination of thyroid tissue. It has little clinical importance. (4) Chronic thyroiditis frequently produces considerable constriction of the trachea with pressure symptoms, and requires surgical relief. (5) An operation for the removal of the isthmus relieves the constriction and does not produce myxœdema. (6) Myxœdema is particularly apt to follow operations on the thyroid for thyroiditis.

Adenoma of the Thyroid.—D. H. Bessesen⁵ points out that this is a dangerous lesion, whether toxic or non-toxic. Some observers think that from 2 to 5 per cent become malignant after the age of 30. Prior to operation the size of the thyroid may be fairly accurately determined by a simple method devised by Lahey. Tipping the patient's chin upward and turning the head to one side, by finger pressure against the larynx, this structure with its attached thyroid is disengaged and forced laterally. In this position, the disengaged portion of the thyroid can be felt easily between the examining fingers.

J. K. McGregor and W. Gordon Cornett⁶ state that *spontaneous hæmorrhage into a cystic adenoma of the thyroid* is of frequent occurrence. They report an unusual case in which the hæmorrhage ruptured through the thyroid capsule and infiltrated the muscle and fascial planes of the neck. The extravasated blood spread into the mediastinum and caused death. These writers come to the following conclusions: (1) The frequency of spontaneous hæmorrhage into the thyroid gland is well established. (2) Furthermore, this takes place most often into thyroid adenomata, and particularly into those which show cystic degeneration. (3) Pathological examination of the thyroid tissue removed in this case shows multiple cysts with inflammatory reaction, and extensive hæmorrhage into the cystic areas and the interstitial tissue. (4) The unique feature of the case is the extent of the hæmorrhage. The bleeding seemed to originate from vessels at the lower pole or from an angiocavernous vein in a cyst wall. From here there was an extensive rupture through the thyroid capsule, with infiltration of the muscle planes and superficial tissues down to the apices of the lung and the mediastinum. (5) One similar case, that of Von Ziemacki, has been reported under the very apt title

"A Case of 'Apoplexia Glandulæ Thyroidæ'". Because of the rarity of so extensive a hæmorrhage the authors' case was worth reporting.

The reviewer reported a somewhat similar case ten years ago (*MEDICAL ANNUAL*, 1923, p. 464). The patient was a woman over 60 who suffered for years from a right-sided goitre which produced no symptoms and caused no inconvenience. A near relative died suddenly, and, on receipt of this news, the goitre immediately enlarged. Pressure symptoms arose, and at the end of three weeks became alarming. There was now a diffuse swelling in the neck, quite immovable, markedly tense. It extended from below the right ear to the clavicle and across the mid-line to become lost behind the sternum. Breathing was very difficult and swallowing almost impossible. The diagnosis of hæmorrhage was made at the time. A small incision was made over the most tense portion of the swelling under local anæsthesia, and a large quantity of changing blood-clot, not recent, welled out with the help of a spoon. A few days later the patient died. The nature of the swelling in the neck suggests in this case that the blood had extravasated outside the limits of the thyroid capsule.

Mortality in Goitre Operations.—H. M. Clute⁷ deals with the operative mortality in goitre: 1197 operations were performed on 993 patients with goitre in the Lahey Clinic. The operative mortality was 0.66 per cent. Clute rightly points out that in the absence of toxic or other complications, there should rarely be any operative mortality. There was but one death in 390 non-toxic adenomatous goitres operated upon in 1931.

Tetany following Thyroid Operations.—The reviewer has operated upon a large number of goitres in Mercer's Hospital, Dublin, over a period of twenty-eight years. After two of the earlier operations tetany was noticed. Both recovered with **Calcium Therapy**.

Duncan Wood⁸ mentions 5 cases in 425 thyroidectomies. He states that on account of the more radical nature of the excision required, we should expect tetany to be more frequent after operations on exophthalmic goitre or malignant growth. It must be recollected, however, that in simple adenomatous goitres the surgeon is often tempted to perform a complete lobectomy on one side. In hyperthyroidism it is usual to leave some thyroid tissue protecting the recurrent laryngeal nerve and the bed of the parathyroid gland. Wood points out, however, that tetany may arise after enucleation of a cyst, and that in two of his cases the operation was limited to a wedge-shaped resection. The parathyroids lie in pairs near the distribution of the branches of the inferior thyroid arteries, and are supplied by these vessels. Tetany may be due to crushing by artery forceps, or by tying off this blood-supply. Tetany may follow several operations as a result of scar formation interfering with the parathyroids. In one case quoted by Aub, symptoms did not commence until two months after operation. Symptoms may occur from six hours to four months after thyroidectomy. In five cases tetany started at 12 hours, 24 hours, 24 hours, 7 days, and 8 days respectively after operation.

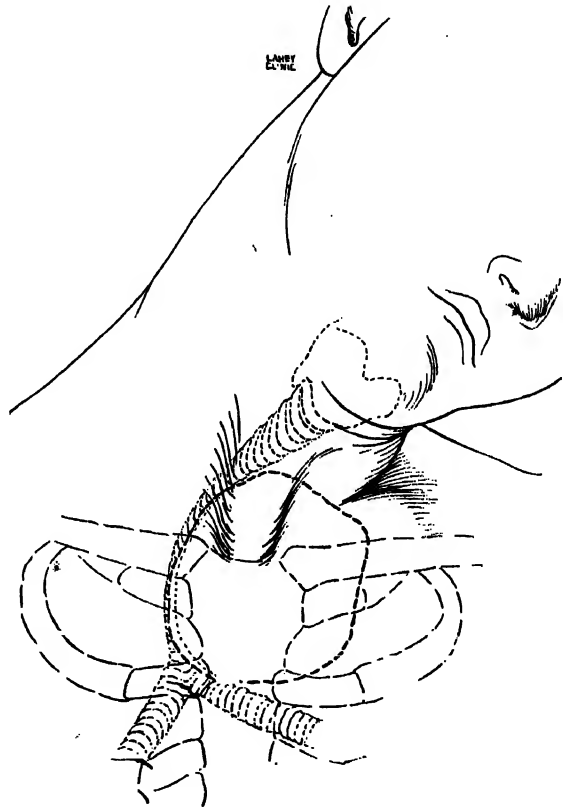
There are two stages in the symptoms of tetany. The most acute phase, with spasm of the limbs, is obvious. The elbows and wrists are flexed and the hand pronated. The thumb is opposed to the palm, the knuckle-joints are flexed, and the other finger joints extended, forming the so-called 'accoucheur's hand'. In the lower extremities the hips and knees are kept extended, the feet and toes being in plantar flexion. The distribution of the contractures varies in different cases. Thus in Case 1 the left foot, but not the right, was affected. In Case 4 the right hand was more affected than the left. In Case 5 the contractures in the feet did not start until some hours later than in the hands. Severe pain is complained of.

In the alternate phase there is no pain. The patient complains of a feeling of discomfort, of pins and needles, of stiffness and weakness, especially in the forearm or calf. These are warning symptoms that the neuro-muscular system is in an irritable state.

That these symptoms are genuine may be supported by various signs. Chvostek showed that tapping the facial nerve set up spasm of that side of the face. Trousseau activated the latent spasm in the extremities by applying compression to the proximal end of the limb.

In 1909 MacCallum first showed experimentally that hypocalcæmia was associated with parathyroid tetany, and that injections of **Calcium** into the blood relieved the muscular spasms. With regard to dosage by mouth, Hunter

Fig. 90. — Showing diagrammatically why some patients with intrathoracic goitres suffer interference with breathing when sleeping with one side of the head on a pillow and no interference with the head on the other side. Note that with the head on one side the trachea becomes stretched over the intrathoracic adenoma and that the adenoma is fixed in its position by being lodged against the upper thoracic cage. (Figs. 90-93 by kind permission of 'Surgery, Gynecology and Obstetrics'.)



advises up to 30 grm. daily. In normal individuals the rise in blood-serum calcium, after a dose of 10 grm., is only 14 per cent. Hunter was able to control the blood-serum calcium of his patient, who had suffered from chronic tetany for twenty-two years, by giving 10 grm. of calcium daily. If the symptoms are severe, with laryngeal spasms or convulsions, he advises intravenous injection of 20 c.c. of a 5 per cent solution of calcium chloride. Aub states that similar intravenous doses will relieve other types of spasm, such as renal or gallstone colic.

Four of the cases in Wood's series were treated with the calcium. In Case 1 calcium lactate, 60 gr., was given by mouth four-hourly. The painful

spasms ceased in three hours. Contractures of the hands lasted fifteen hours. The author concludes: (1) Tetany may follow thyroid operations, whether properly or improperly performed; (2) In the majority of cases the symptoms can be cured by calcium.

Intrathoracic Goitre.—F. H. Lahey* deals with the management of this condition. Intrathoracic goitres are either complete or incomplete, depending upon the proportion of the growth below or above the level of the sternal notch. Most are adenomatous, and when completely intrathoracic they often are centrally liquefied and changed into a cyst. Sometimes the lowermost point of the growth may be below the level of the aortic arch. The symptoms produced are for the most part the results of pressure of the goitre upon the trachea. Patients with intrathoracic goitres have complained that sleeping with one side of the head on the pillow produces difficulty in breathing, while sleeping on the opposite side does not produce similar difficulty. The explanation is shown in *Fig. 90*.

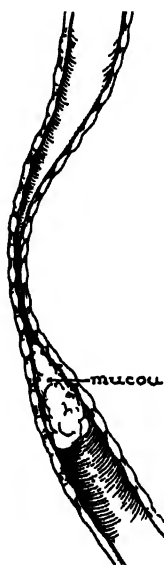


Fig. 91.—Diagrammatic illustration showing the narrowing of the intrathoracic trachea by pressure from an intrathoracic adenoma and how a plug of mucus can readily obstruct breathing by lodging in this narrowed portion.

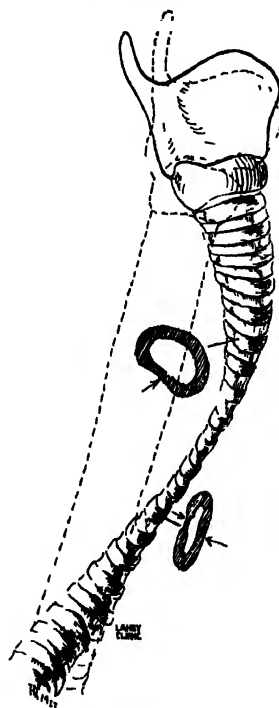


Fig. 92.—Showing diagrammatically the rotation of the larynx which not infrequently occurs with marked lateral deviation from the pressure of an intrathoracic goitre. Note that the notch of the thyroid cartilage no longer presents anteriorly but is rotated into a lateral position.

Some patients give a history of several experiences with threatened suffocation, occurring while asleep at night. The most probable explanation is that during sleep there is an accumulation of mucus in the trachea below the point where the trachea is narrowed by the intrathoracic goitre (*Fig. 91*).

Another diagnostic feature is rotation of the trachea so that the notch of the thyroid cartilage is rotated or dislocated laterally (*Fig. 92*). The final diagnosis of intrathoracic goitre rests upon the demonstration of an X-ray shadow within the thorax, and more particularly upon the position of the

PLATE LIV

INTRATHORACIC GOITRE

(P. H. LAHEY)

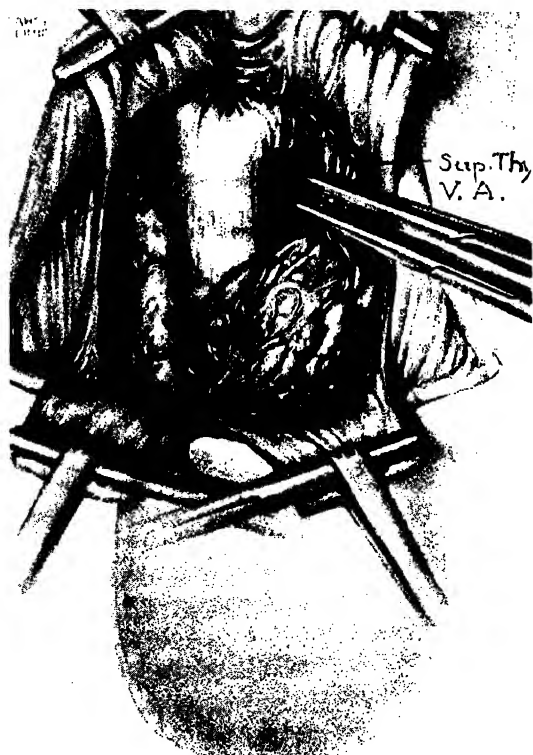


Fig. A.—Showing the preliminary ligation of the superior thyroid vein and artery as the first step in the removal of a deep intrathoracic goitre as suggested by Pemberton.

*Plates LIV–LVI by kind permission of
'Surgery, Gynecology and Obstetrics'*

PLATE LV

INTRATHORACIC GOITRE--continued

(F. H. LAHEY)



Fig. B. Showing how the goitre may be turned forward after the ligation of the superior thyroid vessels, thus exposing the great vessels and the natural line of approach along the sheath of these vessels, in which place the finger can readily be inserted into the mediastinum.

PLATE LVI

INTRATHORACIC GOITRE—continued

J. H. LAMLEY



Fig. C.

Fig. C. Showing how, as the finger is inserted downwards towards the mediastinum along the great vessels, it can be hooked up to catch the middle-thyroid veins as they pass from the internal jugular into the upper part of the intrathoracic goitre. These should be cut and ligated at this point to prevent tearing of the veins in delivery of the mass and consequent profuse venous bleeding.

Fig. D. Showing how the finger may be inserted into the mediastinum from behind and swept laterally about the tumour to loosen it from the condensed layer of connective tissue about it.



Fig. D.

trachea in relation to this shadow. In most instances intrathoracic goitres are so located to one side of the trachea that the structure tends to be laterally dislocated, producing the typical intrathoracic shadow, with the trachea curving around the portion of the goitre against which the trachea rests. Occasionally one sees a prolongation of a multiple adenomatous goitre directly downward behind the sternum in the middle line, so that the trachea is not dislocated but is flattened from before backward.

Dilatation of the superficial thoracic veins over the upper chest wall is common in intrathoracic goitre and is due most probably to the fact that the intrathoracic extension presses upon and obstructs one or both internal jugular veins, thus causing compensatory dilatation of the superficial venous system (Fig. 93).

The reviewer believes that this contribution of Lahey's on intrathoracic goitre is very valuable. He has seen the diagnosis of many cases missed because X rays were not employed during the investigation. The cases were treated, *inter alia*, for cardiac disease, for asthma, for nasal or for laryngeal trouble, when the real cause was a cystic adenoma placed in the superior mediastinum.

In removing an intrathoracic goitre, local anaesthesia or light colonic ether is employed by the reviewer.

The procedure is commenced as if for routine thyroidectomy. The superior thyroid artery and vein are divided and the upper pole of the gland made free (the blood-supply of a mediastinal goitre comes from above). Attempts to pull the intrathoracic goitre out of the mediastinum by traction will usually be unsuccessful. *Plates LIV—LVI* show the stages of the operation admirably.

The delivery of a retrosternal goitre reminds the reviewer of the delivery of an ovarian cyst from the pelvis through a short mid-line abdominal incision. A finger is passed into the mediastinum, finds the line of cleavage round the tumour, and finally coaxes the growth out through the incision by pressure from below upwards. In passing the finger downwards the line of cleavage will not be found until the middle thyroid veins running from the internal jugular to the tumour are divided. Lahey states that it is much easier and much safer in cases of intrathoracic goitre to pass the finger into the mediastinum from the rear than along the front of the tumour. Pressure from below and traction from above, gentle and gradual, will lead to the successful delivery of large intrathoracic goitres. Ligation of the inferior thyroid artery has rarely



Fig 93 Diagrammatic illustration of the dilated superficial thoracic veins in a patient with a completely intrathoracic goitre. This is the compensatory dilatation of these veins due to pressure on the internal jugulars and interference with the return flow of blood from the head

been necessary. As soon as the intrathoracic mass is delivered, the cavity behind the sternum is packed while the goitre is being removed. The pack is then removed and with a good light oozing veins are caught and ligated.

Lahey, from experience, has found it safest to pack the cavity lightly in order to control any overlooked oozing. This packing with gauze (or cigarette drains) should be left for as long as two or three weeks, changing it when necessary.

Thyroidectomy in the Young.—E. I. Greene and J. M. Mora¹⁰ discuss this question, and give the following summary: (1) A report is given of 26 cases in which thyroidectomy was done for thyrotoxicosis, the patients being children between the ages of 8 and 16 years. These cases are a part of a series of 1200 consecutive toxic goitre patients, who were subjected to operation. (2) There were 22 girls and 4 boys. (3) The outstanding symptoms and signs were: tachycardia, nervousness, goitre, exophthalmos, tremor, weight loss, palpitation, left heart enlargement, irritability, weakness, and restlessness. The symptoms correspond closely with those manifested in adults. (4) The average pre-operative systolic and diastolic blood-pressure readings were 182 and 65 mm. respectively. The postoperative readings were 108 and 72 mm. The average pulse pressure dropped from 67 mm. to 36 mm. after operation. (5) The average pre-operative basal metabolic rate was +84.6. The average postoperative reading was -6.2. (6) All of the glands examined microscopically showed varying degrees of hyperplasia and hypertrophy. (7) One-stage thyroidectomy was done in every instance. (8) There were no deaths in this series.

Post-operative Thyrotoxicosis.—C. H. Goodrich¹¹ recommends the intravenous use of **Iodides** for this condition. He points out that the destructive metabolic storm after operation has been greatly lessened by the administration of **Lugol's Solution** by the mouth or by the rectum, combined with the intravenous injection of **Glucose Solution**. In a case which did not respond to the administration of Lugol's solution (10 min. every four hours) there was a rising pulse, rising temperature, persistent and increasing nervousness and anxiety, with dyspnoea and failing circulation. Lugol's solution was increased. Glucose was administered intravenously; restlessness was treated by morphine. Seventy-two hours after operation the patient seemed moribund. **Sodium Iodide Solution** was given intravenously, 15 gr., followed by a similar dose after three hours. The condition of the patient completely changed, a miraculous improvement having taken place. Two doses were given at twelve hours' interval on the following day, then 10-gr. doses twice daily for two days. This treatment was followed by a satisfactory and complete recovery. The writer believes that direct intravenous use of sodium iodide is much better and more certain in action than oral or rectal administrations of Lugol's solution.

Carcinoma of the Thyroid Gland.—T. B. Dunhill¹² summarizes a learned and convincing paper as follows:—

1. There are three types of cancer of the thyroid: scirrhus, papilliferous adenocarcinoma, and malignant adenoma.

2. Scirrhus does not differ from the same disease occurring elsewhere.

3. In the thyroid gland epithelial proliferation is the characteristic response to stimulation. The proliferation may resolve spontaneously or under treatment; it may form a benign tumour, or it may form a tumour which invades and disseminates. These stages merge into one another by insensible gradations. These histological gradations cause difficulty in deciding just when a tumour has become malignant.

4. Proliferation of thyroid epithelium may be papilliferous or follicular in type. Papilliferous adenocarcinoma may be an ultimate result of the former, malignant adenoma of the latter.

5. It is suggested that the cause of carcinoma is stimulation, which may be normal and affecting tissue which is sub-efficient, or so excessive in degree as to be abnormal and amount to irritation.

6. Although in cases of carcinoma of the thyroid specific glandular structure is frequently retained both in the parent growth and in the metastases, the essential character of the disease conforms to the same laws observed in carcinoma of other glandular organs, and its cause is possibly the reaction of the glandular epithelium to irritation, as suggested by other workers in, for example, carcinoma of the breast.

7. A nodule in a thyroid gland should not be regarded as of no importance, and early changes in the signs or symptoms associated with it should induce the practitioner to investigate the cause of these changes.

8. Histological examination should be made in every case of removal of thyroid tissue, and sections should be taken from different areas.

9. Advanced cases should not be regarded as hopeless. When the condition of the patient justifies it, as much of the tumour should be removed as possible, and then X-ray treatment commenced. By this means comfort is given, and life is sometimes prolonged to a surprising extent.

REFERENCES.—¹*Ann. of Surg.* 1932, April, 503; ²*Irish Jour. Med. Sci.* 1932, June, 287; ³*Ann. of Surg.* 1932, April, 529; ⁴*Ibid.* 493; ⁵*Med. Jour. and Record*, 1931, Oct. 21, 389; ⁶*Canad. Med. Assoc. Jour.* 1932, June, 711; ⁷*New Eng. Jour. Med.* 1932, June 16, 1240; ⁸*Bristol Med.-Chir. Jour.* 1931, Autumn, 205; ⁹*Surg. Gynecol. and Obst.* 1931, Sept., 346; ¹⁰*Ibid.* 375; ¹¹*Amer. Jour. Surg.* 1931, Aug., 9; ¹²*Brit. Jour. Surg.* July, 83.

TONSILS, DISEASES OF. (See also AIR-PASSAGES, UPPER, AND POST-CRICOID REGION, MALIGNANT DISEASE OF; CANCER, RADIUM TREATMENT OF—ORAL CANCER.)

F. W. WALKYIN-THOMAS, F.R.C.S.

End-results of Tonsil Operations.—Kerr Love,¹ discussing the end-results of the "so-called tonsil and adenoid operation", remarks that "a quarter of our population during the school age are being deprived of their tonsils and adenoids". On the whole he believes that the results justify the disturbance to the child and the cost to the community. In fifteen years, 23,000 operations were done, 12,000 in the city of Glasgow and 11,000 in the county of Dumbarton. During this period there has been no death from bleeding, and, where the tonsil and adenoid operation alone was done, no death under an anæsthetic. Two groups of cases were examined (218 by Arbuckle Brown six to nine months after operation, 280 by Kerr Love twelve to eighteen months after). In addition a questionnaire was sent to twenty practitioners in the county and their replies were tabulated. The results obtained by these different inquiries correspond closely and may be summarized thus:—

1. Effect on general health: nearly always good.
2. Effect on conditions of throat, nose, and chest: good.
3. Effect on hearing: good, especially if operation be done early.
4. Aural discharge: usually good but often negative. (The operation cannot be expected to cure an old discharge due, e.g., to scarlet fever.)
5. Mouth breathing: nearly always good, especially if done early.
6. Effect on enlarged glands in neck: nearly always good.
7. Results on nasal discharge: often good, but fails in many cases to give immediate improvement.

8. Liability to infectious diseases after operation: the practitioners' opinions were unanimous that children were less liable after operation. Kerr Love is more cautious; his own figures show "rather less liable to those infectious diseases where tonsillitis is usually found".

9. Liability to subsequent acute ear affections: the majority hold that operated children are less liable, some are doubtful. One opinion to the contrary. Kerr Love himself found that, apart from the acute otitis media that occasionally follows operation, the incidence is much lessened.

Several other important points are noted. Kerr Love, although strongly in favour of tonsillectomy rather than tonsillotomy, has rarely seen any ill effects from the 'tags' and 'regrowths', which are usually hypertrophies of the lingual tonsil. Also, he believes that adenoids are not removed often enough or early enough, and that tonsils are removed too often and too soon.

The removal of tonsils and of adenoids are really two distinct operations, and although they may often conveniently and justifiably be done together, it is wrong to take it for granted that one necessarily implies the other.

Sore Throats of other than Tonsillar Origin.—Bedford Russell¹ draws attention to the fact, often forgotten, that tonsillar infection and 'sore throats' may be due to infection from above. It is 'the proper function of the fauces to inflame at the intrusion of micro-organisms', and if tonsils are removed for doing their duty without regard to the condition of the sinuses, the 'sore throats' will be made worse rather than better. Another but rare cause of sore throat from above is a discharge of pus from a suppurating middle ear down the Eustachian tube.

There are some characteristic points which should suggest a nasal origin. The onset is usually sudden and comes on regularly with a cold, even when the tonsils have been correctly removed. The inflammation is often asymmetrical, and there is often a coating of discharge on the posterior pharyngeal wall. The case is strengthened if there is any cough or other laryngeal symptoms. In any such case a thorough examination of the nose and accessory sinuses should be made. In Russell's opinion ethmoiditis is as common a cause of such a condition as antral infection. It must be remembered that it has been proved that sinus suppuration is far more common in children than is generally believed.

Removal of Tonsils by Diathermy.—This subject has attracted considerable attention, but several writers in their claims far exceed the studied moderation of McKenzie's paper discussed in the MEDICAL ANNUAL last year (p. 532). A. L. Forster² states that it is "undoubtedly destined to eventually supplant surgical tonsillectomy". Among the disadvantages of surgical tonsillectomy he quotes pulmonary abscess, aspiration pneumonia, middle-ear abscess and suppurative inflammation of the cervical glands, the inspiration of teeth and portions of tonsil instruments, and uncontrollable hæmorrhage. [He does not mention the tying of bleeding points and removal of tonsils in the head-hanging position which is becoming a routine method in British surgery.—F. W. W.-T.] He also refers to "many throats mutilated beyond repair". He believes that four or five diathermy applications to each tonsil are sufficient, and that it is 'generally admitted' that part of the tonsil is left in one-fourth of all cases of surgical removal. Further, he alleges that there is no loss of blood when tonsils are removed by diathermy and that infection and secondary infection are impossible; finally that "criticism of this method . . . comes as usual, largely from those who have never tried it, never seen it used, and know nothing about it".

W. A. Gross,⁴ in a careful account of his own method, although so convinced of the value of diathermy that he believes that in the near future a large percentage of adult tonsils will be treated by this method, states that hæmorrhage may occur, usually as a result of too deep coagulation, but should be extremely rare. Also he finds that insertion of an electrode directly into a crypt may cause an abscess.

J. A. Haiman,⁵ who is also convinced of the value of the method, warns us of the danger of excessive coagulation, which may not only cause hæmorrhage but may cause fibrosis and encapsulation of lymphoid tissue.

R. Graham Brown and J. V. Duhig⁶ find that diathermy is liable to fail in destroying the tonsil and rendering the residue sterile; that it has its sphere of usefulness, but that the sphere is a very limited one indeed; that "a degree of patience which is seldom found in patients and still less in surgeons is a necessary requirement if the process of destruction is to be carried to its satisfactory conclusion. Speaking generally this perfect result seems seldom to be attained."

[For selected cases diathermy in expert hands is a valuable method, but it is clear from a study of the literature that the method is laborious and difficult, and that it is as much or even more a method for the trained expert as is the ordinary operation of dissection. It would be most unfortunate if exaggerated claims brought a valuable adjunct of treatment into disrepute.—F. W. W.-T.]

Complications following Tonsillectomy in Childhood.—J. A. Keen⁷ deals with this subject in a paper based on the records of 9344 operations performed by him in a period of ten years. All operations were done at the Leicester School Clinic, all were done under chloroform-ether anæsthesia with an open mask, and all were done by the 'reversed guillotine' method.

There were 23 cases of *lung complications*; all recovered. There were 5 cases of bronchopneumonia, 13 of lobar pneumonia, and 5 of bronchitis. There does not seem to have been any evidence of 'seasonal incidence', and none of the case histories suggest lung abscess.

Toxæmia in varying degrees was not uncommon. In Keen's experience 1 child in every 30 cases had a 'delayed convalescence' which should be regarded as toxæmic. In 5 cases there was an *acute adenitis*, which resolved without trouble. In 5 cases there was generalized *septicæmia*, with one death.

Collosol Argentum intramuscularly was found to be valuable.

Acute specific fevers occurred as follows: 3 cases of diphtheria, 2 of mumps, 4 of measles, 7 of chicken-pox, 1 of whooping-cough, 5 (doubtful) of scarlet fever, and 18 scarlatiniform rashes. Diphtheria under these circumstances seems very dangerous; 2 of the 3 children died. Measles, mumps, etc., showed no connection with the operation, but scarlet fever is in a different category. All the cases seem to have been doubtful; it is possible that the 5 cases diagnosed as scarlet fever, like those with the vague rashes, were due to mild streptococcal infection not of the true scarlet fever group.

Acute otitis media occurred in 60 children, of whom 6 developed mastoiditis and 3 died, 2 of meningitis, 1 of septicæmia. There was a remarkable preponderance of *right-sided* otitis (37 right, 15 left, 8 bilateral). Keen noted that of 100 children after operation 63 lay on the right side and 37 on the left.

Glottic spasm occurred 5 times; on one child a laryngotomy was performed, in another subcutaneous emphysema appeared on the following day.

Spontaneous Hæmorrhage from the Tonsil Region.—Torsten Skoog⁸ remarks that the most serious cases are those where hæmorrhage is associated with peritonsillar abscess. Erosion of the arteries may be due to direct extension of phlegmonous inflammation and local ulceration; this appears to be the case with hæmorrhage from the ascending pharyngeal. The more usual cause is suppuration in a gland in contact with the artery, and erosion from the suppuration. In the veins pressure is so low that inflammatory swelling blocks the vessel, and thrombosis is more likely than hæmorrhage.

Frequently before hæmorrhage occurs a 'spurious aneurysm' forms, and a large bluish swelling appears in the pharyngeal wall. If the aneurysm is on

the internal carotid it may erode and burst into the Eustachian tube or the external auditory meatus.

In 29 fatal cases the internal carotid was affected in 26. In 88 cases which recovered, the external carotid was tied in 10, the common carotid in 18, and 10 recovered after local measures such as sponge pressure or ligation of a small vessel after tonsillectomy.

Skoog advises open operation in every case of spontaneous hæmorrhage in a patient with a peritonsillar abscess. As a rule he ties the external carotid and leaves a loose ligature around the common, which can be tied immediately if there is any recurrence of hæmorrhage. Routine ligation of the common carotid is not advised, as the risk of cerebral softening, which is always present if this is done, is much increased in a patient suffering from a severe infection.

Spontaneous hæmorrhages, usually small, also occur in some cases of Vincent's angina, and from dilated venules in the pharynx in chronic pharyngitis.

P. G. Gerlings⁹ agrees that hæmorrhage from peritonsillar abscess is a most serious complication, and states that in unoperated cases the mortality is 80 per cent. His views on treatment differ from those of Skoog. He, too, believes in prompt exposure and ligation, but he holds that the common carotid should be tied except in cases where the hæmorrhage can be shown to come from the external carotid or one of its branches, which he thinks is rare. He describes 8 cases in which there was myosis on the affected side, showing paralysis of the sympathetic. In one of these cases ptosis was present as well, and in this case the abscess burst into the external auditory meatus and into the pharynx, with hæmorrhage.

Abscess of the Lung following Tonsillectomy.—C. E. Benjamins¹⁰ discusses the frequency of this condition. The United States figures are taken first. Cutler and Schleuter reported 1908 cases, over 500 of which followed surgical operations, and of these operations more than half were tonsillectomies. The Mayo Clinic reported 48 cases after tonsillectomy, 14 after tooth extraction, and 38 after laparotomy. Flick gave a total of 172 cases, 97 after tonsillectomy. These figures are far higher than those on the Continent. Benjamins believes that there are two routes of infection to the lung: (1) Inhalation of septic material during or *immediately after* operation; (2) Embolism of the lung from the entry of septic material into the veins during operation. The higher rate in the American figures he attributes to the fact that in the States the operation is usually done under general anæsthesia with dorsal decubitus, and on the Continent local anæsthesia and the sitting position are the rule. One objection to this explanation is that Meyersohn examined with the bronchoscope 200 infants after tonsillectomy under general anæsthesia and found blood in the bronchi in 77 per cent. But Iglauer, who made similar observations and found blood in the bronchi in 40 per cent, found it also present nearly as often when the patient had been operated on under local anæsthesia. Another objection to this explanation is that in this country, where operation under general anæsthesia is the rule, cases of lung abscess following tonsillectomy are very rare. A more likely explanation seems to be the practice of removing acutely inflamed tonsils, which, according to Benjamins, is more common in the States. As a result of inquiry among his colleagues in Holland, Benjamins could only find two cases of lung abscess following tonsillectomy, and in one of these cases the tonsils were acutely inflamed at the time of operation. (*See also LUNG, ABSCESS OF.*)

REFERENCES.—¹*Lancet*, 1932, i, 1356; ²*Brit. Med. Jour.* 1931, ii, 485; ³*Med. Jour. and Record*, 1931, Sept. 16, 290; ⁴*Ibid.* 1932, March 2, 214; ⁵*Arch. Phys. Therapy*, 1931, xi, 349; ⁶*Med. Jour. of Australia*, 1931, Oct. 10; 1932, July 2; ⁷*Jour. Laryngol.* 1932, xlvii, 1; ⁸*Arch. f. Ohren.* 1932, cxxx, 260; ⁹*Acta Oto-laryngol.* 1932, xvii, 394; ¹⁰*Rev. de Laryngol.* 1931, ii, 119.

TOXICOLOGY.*G. E. Oates, M.D., M.R.C.P., D.P.H.*

Poisoning by Mercury.—S. S. Berger, H. S. Applebaum, and A. M. Young¹ state that an analysis of 168 cases of mercuric chloride poisoning in the Mount Sinai Hospital of Cleveland both from the clinical and particularly from the pathological point of view has demonstrated the importance of gangrenous colitis in the course of mercury poisoning. The causes of death in this condition fall into three groups: (1) Shock, following an extensive and severe gastritis; (2) Retention of nitrogenous substances, following a severe necrotizing nephrosis; (3) Later, an extensive and severe gangrenous colitis, the kidney lesion showing evidence of healing.

Kidney involvement is prompt in mercurial poisoning, beginning within twenty-four hours after ingestion. Gangrenous colitis appears later, from six to twelve days afterwards. If mercury damages the kidneys early and severely so that they are unable to further the elimination of the poison, then the other channels are brought into play, chiefly the colon.

The writers consider that measures to combat the colonic condition must therefore of necessity assume an important rôle in the treatment of mercurial poisoning, and they have found immediate **Cæcostomy** and constant **Colonic Lavage** to be most effective. They have abandoned late cæcostomy, as it only adds to the suffering of the patient, without influencing the issue. They consider it essential to establish the diagnosis of mercurial poisoning before operating, employing the electrolytic method of Booth and Schreiber² on the gastric lavage. This can be done in a few minutes. The patient must not be suffering from severe shock. Three cases are reported in which this form of treatment apparently saved the patient.

Lead Poisoning.—E. Bramwell,³ reviewing thirty cases of chronic lead poisoning, insists on the importance of a knowledge of the varied symptomatology of plumbism. If the patient is not engaged in a lead trade and does not come from a district with plumbo-solvent water, it may easily happen that the real cause of obscure nerve lesions may be overlooked. Lead may be found in the urine, but just as often it is absent, owing to the retention of the lead in the tissues. It is often worth while examining the drinking water. It is important to bear in mind the possibility of diachylon poisoning when one is consulted by a woman of child-bearing age who complains of severe headache and vomiting, who is perhaps anæmic, and in whom there is a history of amenorrhœa. A single dose of diachylon may produce symptoms of poisoning; these may persist for months and may be aggravated by an intercurrent febrile illness.

N. Porritt⁴ states that there are two types of plumbism: one, the classical lead poisoning of the text-books, caused by massive doses; the other, little known, a slow, subtle, insidious saturation of the system by infinitesimal doses of lead extending over a long period of time, and producing a group of symptoms altogether different from the recognized forms of plumbism. These are mainly lethargy and weariness of body and mind, with constipation. The patient is always benefited by a 'change of air'—or in other words by a change in domestic water-supply. The diagnosis can only be made by finding lead in the urine and perhaps in the water-supply. The author also states his suspicions that puerperal eclampsia has a higher incidence in areas with a soft plumbo-solvent water-supply. Since statistical evidence as to the incidence of puerperal toxæmias, apart from the mortality, in various areas is very scanty, this would appear to be a useful subject for further inquiry.

F. G. Pedley and R. V. Ward⁵ examined 38 men engaged in the manufacture of railway bronze. They were referred to hospital for various ailments and accidents. Of these 38 men, 24 were cases of active lead poisoning, 9 were

cases of lead absorption without symptoms, and 5 showed no symptoms of plumbism. Three brass polishers working at the same emery wheel were found to have lead poisoning. The analysis of the air in one foundry showed the concentration of lead in the air to be about 0.85 mgrm. per cubic metre. Their review of the literature of chronic brass poisoning indicates that many cases of chronic disability occur amongst founders and polishers of brass, and that the symptoms recorded are closely allied to those of lead poisoning. They believe that lead plays an important part in the disease picture variously diagnosed as brass poisoning, bronze poisoning, and copper poisoning.

Arsenic and Wallpaper.—W. M. T. Wilson⁶ comments on a case of fatal illness reported in the press, in which the suggestion had been put forward that arsenic from wallpaper had been responsible. In the above case the wallpaper was found to contain 4.4 parts of arsenious oxide per million, equivalent in this instance to 0.00278 gr. of arsenic per square yard of wallpaper. The State of Massachusetts, U.S.A., permits $\frac{1}{10}$ gr. of arsenic per square yard of wallpaper, whilst Dutch law allows 5 mgrm. per square metre, which is equivalent to 0.0645 gr. per square yard. As the amount of arsenic in the wallpaper concerned in the case was less than one-twentieth of the amount permitted in those States which have fixed a standard, it may be ruled out as a contributory cause of death. It is well known that arsenic is so widely distributed an element that there are in consequence very few raw substances which do not contain traces of it as impurities. In bygone days arsenical pigments were employed in wallpaper manufacture, but their use has long since been discontinued, and the principal English makers of wallpaper have for many years bought all their raw materials on the understanding that they are commercially free from arsenic. The author suggests that great caution should be exercised before any opinion is expressed that wallpaper can be responsible for arsenical poisoning.

Strychnine Poisoning.—H. W. Haggard and I. A. Greenberg⁷ consider that the methods of treatment for strychnine poisoning in use are apparently not very effective. They consist of emetics or the use of the stomach tube for the recovery of unabsorbed strychnine; but because the latter procedure precipitates convulsions, it is frequently necessary to anaesthetize the patient while it is being carried out. Treatment is then directed towards the control of convulsions to avoid fatal asphyxiation or exhaustion, and to this end antispasmodics and volatile anaesthetics are commonly employed. The latter are prone to cause respiratory failure when given in amounts sufficient to control convulsions; their use is thus attended with some risk. Morphine is said to augment rather than to allay convulsions.

The authors find experimentally that magnesium sulphate does not prevent or even diminish strychnine convulsions in rats. It is not an antidote for strychnine. They find that **Apomorphine** controls strychnine convulsions in rats and dogs. It allows recovery after approximately twice the lethal dose of strychnine, but not when the dose is three times the lethal amount. They report three cases in which the use of apomorphine was followed by recovery in human beings who had taken presumably lethal amounts of strychnine. They find that **Phenobarbital Sodium** controls strychnine convulsions in rats and dogs. Recovery follows the administration of five times the lethal dose of strychnine. A true antagonism between the actions of phenobarbital sodium and strychnine is indicated. Rats and dogs that have received amounts of phenobarbital as high as three times the lethal dose may be saved by the administration of amounts of strychnine which by themselves would be fatal.

O. W. Barlow⁸ finds experimentally that **Pentobarbital*** in small repeated

doses is an effective antidote for as much as thirty-five times the minimum lethal dose of strychnine in the rabbit. He suggests that the safe dose of pentobarbital for an adult man suffering from strychnine poisoning would be $\frac{1}{16}$ gr. per pound for the first dose, and should convulsions recur, half this amount for each succeeding dose. Caution should be exercised if more than four injections are given during the first two or three hours.

Meta-dinitrobenzene Poisoning.—D. Erskine⁹ reports four cases, being sisters, who suffered from methæmoglobinæmia due to the absorption through the skin of meta-dinitrobenzene contained in furniture polish. There was marked cyanosis of the skin and mucous membranes. Two of the cases showed the presence of methæmoglobin in the blood. Three of the cases had apical systolic murmurs which persisted several days after the disappearance of the cyanosis. The respiratory depression was treated by the administration of **Carbon Dioxide and Oxygen.**

Poisoning by Methyl Alcohol.—E. Lesche is quoted¹⁰ as stating that 400 deaths occurred in the winter of 1931–2 in America from the drinking of methyl alcohol. Its toxicity is increased by impurities, and its lethal dose varies. One tablespoonful has been known to cause death. It is less intoxicating than ethyl alcohol, but its after-effects are of longer duration because it is oxidised slowly, and remains in the body five to ten times longer. The poisoned person becomes deeply cyanosed, dyspnoeic, and restless. Twitchings occur in the legs, together with pains in the head and limbs and severe abdominal cramps. The ocular symptoms are characteristic, and range from black spots in front of the eyes to complete blindness, which is always bilateral, and is due to a toxic disturbance of function followed by a progressive optic neuritis. The pupils are dilated, and react sluggishly to light; paralysis of the ocular muscles is not noted. Deafness may occur. With a regular intake of methyl alcohol there is danger of a cumulative effect being produced. In the worst cases the patient rolls about in cramp, vomits, has incontinence of faeces and urine, loses consciousness, and dies as a result of paralysis of the respiratory muscles. Amongst post-mortem findings may be mentioned acute degenerative changes in the grey matter of the brain and spinal cord. Because of the dilated pupils, the cumulative effects, and the abdominal cramps and constipation, the possibility of botulism and of poisoning by atropine, stramonium, or aconite must be borne in mind in making the differential diagnosis. Acetic acid is found in the urine in cases of poisoning by methyl alcohol. With regard to treatment, the stomach must be washed out repeatedly and **Heart Stimulants** given.

Quinine Poisoning.—S. G. Willimott¹¹ reports a fatal case of poisoning in a child of 2½ years after the ingestion of 130 gr. of quinine sulphate. Vomiting, diarrhoea, and, later, convulsions ensued. Death quickly followed, being preceded by cyanosis of the skin and mucous membranes, dilated pupils, and low bodily temperature. Post mortem the viscera, especially the lungs and kidneys, were very congested and the blood almost black in colour. Hæmorrhages were present in the substance of the heart muscle, suprarenals, and kidneys. Careful toxicological examination of the organs gave the surprising result that clear positive findings were obtained in the stomach and contents only, while in the liver traces only were detected. In the remaining organs no quinine was found.

Apart from the amount lost by vomiting, at least one-third of any large dose of quinine ingested is quickly excreted in the urine unchanged. Of the remainder it seems probable that the most part is destroyed in the tissues, a fact which explains the difficulty experienced in the detection of quinine in the viscera. In view of the great use made of quinine in therapeutics cases of poisoning are rare. Some cases of poisoning from quite small doses have been

reported, however, and this is particularly so when the doses are repeated at intervals. It must not be forgotten that apart from questions of personal idiosyncrasy quinine is a general protoplasmic poison and massive dosage is always risky.

Poisoning by Fungi.—H. Limousin and G. Petit¹² describe a new treatment for poisoning by *Amanita phalloides*, which is sometimes mistaken for young field mushrooms and is the most dangerous of our indigenous fungi. They observed that the rabbit has a natural immunity to amanita poisoning by ingestion, but no immunity to the poison injected hypodermically. It was found that the cat, which is highly susceptible to amanita, was partly protected when ingested amanita was mixed with fresh rabbit stomach. That is to say, the cat died from a slowly developing nerve intoxication, but escaped the usual gastro-enteritis and acute liver degeneration. There was evidently a neurotoxin present as well. Next, it was found that the brain substance of the rabbit had the effect of neutralizing this neurotoxin in the stomach of the cat. Later, opportunities occurred to test these methods on the human subject. A family of four partook of *Amanita phalloides* and one died. The other three had serious symptoms—complete lucidity, incessant vomiting and colicky diarrhoea, tender liver, slight jaundice, cyanosis, chilled extremities, and rapid pulse. They were given each three fresh rabbit stomachs mashed and seven fresh brains and a rapid recovery ensued. It is worthy of note that raw liver, which was given in the hope of supplementing the hepatic insufficiency which was likely to follow, exacerbated the symptoms. Animal experiment subsequently proved that liver had an inhibiting effect on the **Rabbit Stomach-brain Mixture**. F. R. Seymour¹³ furnishes an English translation of this important article.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, Feb. 27, 700; ²*Jour. Amer. Chem. Soc.* 1925, Nov.; ³*Brit. Med. Jour.* 1931, ii, 87; ⁴*Ibid.* 92; ⁵*Canad. Med. Assoc. Jour.* 1931, Sept., 299; ⁶*Brit. Med. Jour.* 1932, i, 726; ⁷*Jour. Amer. Med. Assoc.* 1932, Apr. 2, 1133; ⁸*Ibid.* June 4, 1930; ⁹*Guy's Hosp. Rep.* 1931, Oct., 418; ¹⁰*Brit. Med. Jour.* 1932, ii, Epitome, p. 7; ¹¹*Lancet*, 1931, ii, 1133; ¹²*Bull. de l'Acad. de Méd.* 1932, May, 24; ¹³*Brit. Med. Jour.* 1932, ii, 220.

TROPICAL ULCER.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

A good account of tropical ulcer as seen in Rhodesia and its treatment, has been recorded by T. R. F. Kerby.¹ He thinks the contagion is conveyed by flies, as the protection of the skin from abrasions by wearing putties over the legs reduces the incidence of the disease, as does the early covering of abrasions by antiseptic dressings. The ulcers show no tendency to spontaneous healing, but they tend to spread deeply to involve the muscles and tendons, making treatment difficult. Kerby tried **X-ray Therapy** without any material benefit. He regards as an essential preliminary to successful treatment the cleansing of the surface by the application of pure **Carbolic Acid** or **Curettage**, preferably the latter, under a local or general anæsthetic, with the removal of every particle of sloughing tissue and undermined and overhanging edges. **Calcium** and **Cod-liver Oil** are of value. After trying numerous local medicaments the best results were obtained by the application of 'Bipp' after curettage, and then dressing with **Eusol**. **Staphylococcus Antivirus** also had a good effect in cleaning up the ulcers, a piece of strapping overlapping the ulcer by one inch assisted healing after the ulcer had become clean, and **Zinc Ionization** was of use in indolent cases. When curettage is impracticable the liberal use of **Peroxide of Hydrogen** as a swab is best for cleaning up the ulcers. [The reviewer advocated strong **Permanganate Solutions** for this purpose some twenty years ago.—L. R.]

REFERENCE.—¹*Lancet*, 1932, i, 235.

TRYPANOSOMIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY and PROPHYLAXIS.—J. F. Corson¹ has infected four of the small Dik-dik antelope of Tanganyika Territory by inoculating them with *T. rhodesiense* with the production of a very mild infection not involving the central nervous system. The same worker² has carried out courageous transmission experiments on himself with both *T. brucei* and *T. rhodesiense*, with the result that the former did not produce any infection, but the latter dangerous human parasite did produce infection of his blood, by the injection of which into guinea-pigs and rats the infection was also transmitted from man to those animals, after which Bayer 205 treatment was adopted for the human infection. The strain of *T. rhodesiense* used for the human experiment had been carried on for nineteen months on goats and sheep, and had not by that time become converted to *T. brucei*. J. F. Corson³ has also infected all of sixteen rock rabbits—*Hydrax*, which is found in the Maswa sleeping sickness area of East Africa. The incubation period was four days and the trypanosomes were numerous in the blood; tsetse flies readily fed on the animals, so they may be a possible reservoir of sleeping sickness infection.

J. G. Thomson and P. de Muro⁴ have investigated the influence of *Treponema duttoni* infection on that of *T. rhodesiense* in mice, in which animals other observers had previously found trypanosome infections to be modified by treponema and other protozoal parasites. The present experiments confirm the fact that when *T. duttoni* are inoculated into mice, either simultaneously with or previous to inoculation with *T. rhodesiense*, the course of the latter infection is modified and its lethal action delayed, but if the trypanosome infection is given first no such delay occurs. In the combined infections the trypanosomes decrease or disappear about the same time that the treponema disappear from the blood, so the effect is apparently due to the toxins then set free from treponemata. The mice eventually die from the trypanosome infection.

I. J. Kligler⁵ has demonstrated trypanolytic substances in the blood of guinea-pigs infected with *T. evansi* which have a specific effect in destroying some of the parasites, and the surviving ones remain resistant to the action of the serum, but that resistance is lost by repeated passage through rats, whose blood contains no such lytic substance. The more prolonged course of the infection in guinea-pigs as compared with rats may be due to this substance. R. E. Barrett,⁶ working in the West Nile district of Uganda, reports that among over 2000 cases all above three years of age were equally liable to infection, but infants were scarcely ever infected. He thinks this immunity of infants may be related to their heavy infection with malaria, and as their immunity to malaria develops they become more susceptible to sleeping sickness. C. W. H. Gill⁷ reports that the specificity of the Khan test is unaffected by human trypanosome infection.

W. Yorke, F. Murgatroyd, and F. Hawking,⁸ in continuation of their work on the trypanocidal action of certain arsenical and antimonial compounds on *T. rhodesiense*, including strains resistant to atoxyl and acriflavine *in vitro*, now record similar tests *in vivo*. They used mice, and, administering the drugs in a single dose intraperitoneally in 1 c.c. of water, worked out the minimum effective dose to clear the blood of at least 80 per cent, the minimum curative dose in the case of Bayer 205, and the lethal doses of the drugs. The results confirmed the main conclusions of their *in vitro* work and they came to the important conclusion that "the resistance of the atoxyl and acriflavine strains is not a resistance to arsenic, but is dependent on the structure of the substituted phenyl radical in the various aromatic compounds of arsenic and antimony"; for strains resistant to both stibenyl and stibosan were just as

susceptible to tartar emetic as a normal strain. The resistant strains responded to Bayer 205 much as normal strains did. Their experiments also support the hypothesis that, as the minimal effective and curative doses of arsenoxides and arsenobenzols are extremely small compared with those of the corresponding pentavalent compounds, the activity of the former is due to their direct trypanocidal effect, and that the pentavalent drugs act indirectly by being reduced to the trivalent forms. This is also supported by the close parallelism between the minimum effective doses *in vivo* and *in vitro*. The same workers,⁹ in a further note on the nature of drug resistance, support the criticisms of Dale and others of Ehrlich's view that resistance is due to a reduction of the avidity of the specific chemo-receptors for the drug; for their experiments showed that normal trypanosomes are capable of absorbing reduced tryparsamide much more readily than are the resistant trypanosomes, so they think that the atoxyl- and acriflavine-resistant strains are relatively impermeable to these drugs. The theory of Voegtlin, Dyer, and Miller that a trypanosome strain owes its arsenic-resistance to a sufficient excess of sulphhydryl compounds available in combination with arsenic is also untenable in view of the present results.

TREATMENT.—Eleven years' continuous observation on the treatment of sleeping sickness in the Belgian Congo with **Tryparsamide**, with or without combination with other drugs, is recorded by C. C. Chesterman.¹⁰ He has come to important conclusions in the direction of recommending more drastic treatment with less prolonged courses than he formerly advocated. Details regarding 17 first-stage and 251 *T. gambiense* second-stage cases are tabulated and the results analysed; no natural cure has been observed. The cases treated with tryparsamide are divided up in accordance with the dosage given for adults, 'large' ones being 3½ to 4 grm., or 0·06 grm. per kilo, 'medium' 3 grm., or 0·045 grm. per kilo, and 'small' 2 to 2·5 gr., or 0·03 grm. per kilo respectively. Children of 5 to 10 years were given from 0·09 to 0·05 grm. per kilo, and those of 11 to 15 years 0·07 to 0·04 grm. No second-stage case was claimed as a cure unless alive for at least five years after the first course of treatment. The maximum 4-grm. dose was given in a 10-c.c. syringe in a dilution of 1–40 for intravenous use, but for intramuscular use it must be diluted with as much water. All the 17 early cases were cured, with an average of 20 grm. each, and medium to small doses in all but 3, given at fortnightly intervals, and no lasting damage to sight resulted. In second-stage cases, in 37 atoxyl or soamin treatment had already failed, but 7 of these resistant cases were cured by tryparsamide, and 2 of 9 cases in which antimony preparations had failed also recovered under tryparsamide. Among 140 cases treated by tryparsamide alone 51·85 per cent of those receiving 'large' doses were cured, 29·73 with 'medium', and only 12·82 per cent on 'small' doses—most significant differences. Grading the doses by gradually increasing them also gave poorer results than beginning at once with large doses. Intravenous and intramuscular injections gave very similar results, and weekly large doses were more effective than fortnightly ones, but they cannot be given oftener than once a week without serious visual trouble, which occurred in 8, or nearly 30 per cent, of 27 patients on large doses, in about 20 per cent on medium, in 15 per cent on small doses; in about 5 per cent blindness resulted, but in the rest it cleared up. Visual complications are more common in elderly patients with the most abnormal cerebrospinal fluid, indicating 'advanced cerebral changes, and they were less common with longer intervals between the doses. In second-stage cases in which tryparsamide followed a few preliminary injections of Bayer 205 four were cured, and this combination has also been used successfully in Uganda. Previous Bayer 205 appears to increase the danger of visual trouble following

subsequent tryparsamide—apparently owing to the injurious effects of Bayer 205 inhibiting the excretion of tryparsamide—but possibly medium doses of the latter may be effective and safer after Bayer 205. On the other hand, Bayer 205 produces no benefit in patients who are resistant to arsenical preparations. The results of large doses of tryparsamide therefore give the best results in otherwise fatal second-stage cases of sleeping sickness, but the danger of serious visual impairment is a drawback that must always be borne in mind.

P. Manson-Bahr¹¹ reports further on 11 European cases of sleeping sickness treated during eight years, 8 of which were in the easily curable first stage and 3 in the second. In one of the latter tryparsamide was successful after the failure of Bayer 205, and in another a combination of the two drugs was successful. J. F. Corson¹² has watched the cell-count in the cerebrospinal fluid of sleeping sickness cases treated with Bayer 205 and tryparsamide, and concludes that the variations are of no prognostic significance.

REFERENCES.—¹*Ann. Trop. Med. and Parasitol.* 1931, Aug. 13, 211; ²*Ibid.* 1932, March 19, 109; ³*Jour. Trop. Med. and Hyg.* 1931, July 15, 213; ⁴*Ibid.* 1932, Feb. 1, 33; ⁵*Ann. Trop. Med. and Parasitol.* 1931, Dec. 31, 377; ⁶*Trans. Roy. Soc. Trop. Med. and Hyg.* 1931, Oct. 30, 1916; ⁷*Ibid.* 197; ⁸*Ann. Trop. Med. and Parasitol.* 1931, Aug. 13, 313; ⁹*Ibid.* 351; ¹⁰*Trans. Roy. Soc. Trop. Med. and Hyg.* 1932, May 14, 415; ¹¹*Ibid.* 479, ¹²*Ann. Trop. Med. and Parasitol.* 1931, Aug., 189.

TUBERCULOSIS OF JOINTS. (See JOINTS, SURGERY OF.)

TUBERCULOSIS, PULMONARY. *W. H. Wynn, M.D., F.R.C.P.*

Pulmonary Tuberculosis in Medical Students.—The occurrence of phthisis in medical students has attracted attention in several medical schools, but since early adult life is the period at which the disease most frequently shows itself, it is difficult to determine if infection is more common in medical students than in young men of the same age in other occupations. H. W. Hetherington, F. M. McPhedran, H. R. M. Landis, and E. L. Opie¹ have studied the problem in the University of Pennsylvania Medical School. Examinations were made of 279 pre-medical college students and of 452 medical students, and were compared with similar examinations of boys attending high school. Tuberculous infection, indicated by the intracutaneous tuberculin test, increased with age, occurring in 77.8 per cent of the high-school boys, chiefly between the ages of 15 and 18; in 85.6 per cent of the pre-medical students, chiefly between the ages of 16 and 21; and in 93.6 per cent of the medical students, largely between the ages of 21 and 26. The frequency of recognizable calcified nodules in the lungs and lymph-glands did not differ notably in the three groups. Tuberculous infiltrations at the apex of the lungs were somewhat more frequent in pre-medical students than in high-school boys, and had not increased notably in first-year medical students (4.1 per cent). In medical students they increased rapidly from year to year, being 11.6 per cent in second-year students, 14 per cent in third-year students, and 20.5 per cent in fourth-year students. Moreover, the frequency of advanced lesions increased at the same time, 13 students in the fourth year having lesions extending from the apex below the clavicle. Tuberculous infiltration of the apex of the lungs accompanied by symptoms or physical signs—that is, manifest pulmonary tuberculosis—occurred once among the pre-medical students, once during the first two years of medicine, four times in the third year, and nine times in the fourth year. An increasing frequency of grave infection during adolescence and early adult life is evident, but there are available no comparable data concerning the occurrence of tuberculosis in young men pursuing other occupations and presumably in good health. The high incidence of apical lesions

in these medical students increasing rapidly from the ages of 21 to 26 indicates that they were peculiarly subject to advanced tuberculous infection.

A similar study was made at Johns Hopkins University by N. B. Herman, F. H. Baetjer, and J. A. Doull.² On admission approximately 40 per cent of students were negative to the Mantoux test (0.1 mgrm.); a large proportion of such negatives (57.9 per cent) showed evidence of calcification on X-ray examination. If a student is negative to tuberculin on entrance, he was practically certain to become positive before the end of the third year. Accepting as evidence of tuberculosis either a positive tuberculin reaction or a lesion disclosed by X rays, the proportions of infected medical students were: first year 79 per cent; second year 91 per cent; third year 100 per cent; and fourth year 98 per cent.

E. K. Geer³ has investigated the same question among nurses at the Ancker Hospital, St. Paul. It was found that in 1920-8, 42 nurses out of 934 (4.5 per cent) had broken down with tuberculous disease during training or shortly afterwards. It was found that 30 per cent of the nurses entering the Training School showed a positive intradermal test, and that practically all showed a positive reaction before completing training. In 6 out of 110 nurses (5.5 per cent) entering during the past two years tuberculous disease developed; 5 of these gave negative reactions on entering and 3 had pleurisy with effusion.

J. Heimbeck's⁴ observations that student nurses with positive reactions to the Pirquet test present greater resistance to tuberculous infection than those whose reaction is negative suggest the importance of cutaneous allergy in relation to immunity in tuberculosis. He also demonstrated that injection of B.C.G. vaccine in those with a negative reaction can produce a positive reaction within a certain time. Since 1927 this method of vaccination has been followed systematically. Up to July, 1931, 253 nurses with negative reactions showed 75 cases of tuberculosis (29.6 per cent), whereas of 454 with positive reactions, 12 cases (2.6 per cent) occurred: 207 were vaccinated with B.C.G., and among these there were 20 (9.6 per cent) of cases. Of the 207, 40 are eliminated because of inadequate controls and 3 because the incubation time for B.C.G. had not expired, leaving 164 for consideration. In 104 of these the test became positive following vaccination, and in 60 it remained negative. Among the 104 tuberculosis developed in 3, while among the 60 with negative reactions it developed in 16 (26.6 per cent). It seems clear that it is the vaccination with B.C.G. that elicits the positive reaction which really produces an effective resistance, and that if no positive reactions follow no effective vaccination has been produced. Failures with B.C.G. vaccine are due to failure to call forth cutaneous allergy. This may be due to individual variations or to variability in the vaccine. The absence of a reaction following vaccination must be considered as an indication of inadequate vaccination and of the fact that the vaccinated person's liability to tuberculous infection has remained practically unaltered, and that revaccination should be done.

Relation of Pneumoconiosis to Pulmonary Tuberculosis.—Coal-miners, although constantly exposed to the inhalation of both coal-dust and stone-dust, are notoriously less liable to pulmonary tuberculosis than workers in other industries. It is now known that silicosis as well as anthracosis occurs in coal-miners and yet tuberculosis does not follow the silicosis as in other industries. Various writers have failed to find any antiseptic action of the coal-dust. S. Lyle Cummins⁵ suggested that its anti-tuberculous properties may be due to its well-known power as an adsorptive agent. Observations made with Weatherall have proved that coal-dust in fine division can adsorb and inactivate tuberculin solutions to a marked extent. The lungs of

coal-miners may contain over 100 mgrm. of coal-dust, so that the available adsorptive power may be great.

The discovery of the changes in the lungs due to asbestosis prompts the question whether this disease may prepare the way for a tuberculous invasion. E. R. A. Merewether⁶ found evidence of active tuberculosis in the chests of 3 out of 374 asbestos operatives examined whilst at work, and concluded that no outstanding susceptibility to pulmonary tuberculosis was disclosed either among asbestos workers as a class or among those with fibrosis. He pointed out, however, that the supervention of tuberculosis would probably lead to work being abandoned and that therefore the number of tuberculous individuals found at factory examinations does not necessarily show the incidence of the disease.

W. B. Wood and S. R. Gloyne⁷ found 12 cases of tuberculosis in 57 cases of pulmonary asbestosis (2 obsolescent and 10 active). These cases were summarized as follows: (1) Generalized tuberculosis as a terminal event, 1 case (woman aged 21); (2) Acute phthisis with rapid spread and early cavitation, 2 cases (women aged 35 and 20); (3) Extensive subclavicular infiltration but less acute, 2 (women aged 32 and 19); (4) Chronic fibroid phthisis, 5 (women aged 38, 31, 33, and 40, and one man aged 42); (5) Obsolescent disease discovered at autopsy, 2 (woman aged 34 and man aged 42). Bacteriological proof was present in all but one in whom cavitation was shown by X rays. It was impossible to draw conclusions as to whether tuberculosis or asbestosis was the antecedent disease. The cases with tuberculosis are probably more prone to seek advice, so that the above proportion of 17·5 per cent represents a maximum, whereas Merewether's figures probably represent a minimum.

Sanocrysin Treatment.—Considerable differences of opinion upon the value of sanocrysin still exist. K. Secher⁸ holds that many of the poor results reported are due to faulty—usually too low—dosage. All animal experiments have shown the desirability of giving from 1·5 to 2·0 cgrm. per kilo. of body weight. His usual dosage in patients has been 0·5, 0·75, 1·0 grm., the last dose being repeated or increased to 1·25 or 1·5 grm. if the weight of the patient warranted it. The first two or three doses are given at two-day intervals and the others at intervals of four, five, or six days. Patients with acute pneumonic processes have only 0·25 or 0·35 grm. at the first injection as they are likely to have severe intoxication. If practicable the treatment is continued until there is no reaction after doses of 1·5 or 2·0 cgrm. per kilo. of body weight, and is then followed by a sanatorium régime. Secher is convinced that better results are obtained by giving large doses which cause reactions than small doses which do not cause reactions. The latter method requires a large number of injections, of which the early ones are quite useless therapeutically and only increase the amount of metal stored in the organism. The absence of a reaction is by no means a desideratum; the activation of a focus, especially an old focus, may be of the greatest importance to later healing. Gravesen, indeed, asserts that adequate contact between the focus and the remedial agent can only be achieved by means of hyperæmic lung tissue. The total dose should not exceed 6 to 8 grm. on account of storage.

J. B. Amberson, B. T. McMahon, and M. Pinner⁹ treated 12 sanatorium patients with sanocrysin, using 12 similar patients as controls. The sanocrysin was given in doses beginning at 0·1 grm., increasing by 0·1 grm. up to a maximum of 0·5 grm. in nine to fourteen injections. All patients treated with sanocrysin showed evidence of damage to the renal tubules, all but one appearing to have repaired the damage without ill effect. The bacillary content of the sputum showed no marked difference in the two groups. Blood-counts, estimation of plasma proteins, and sedimentation tests were all found to be

unreliable in furnishing evidence of changes in the general condition and the lesions. One patient developed a fatal jaundice. No evidence was found that sanocrysin given in small gradually increasing doses up to a total of 6.1 grm. had any beneficial effect in pulmonary tuberculosis; indeed, compared with control cases, a larger number of the treated cases become worse. Definitely harmful systemic effects were noted in all the treated cases, partly as a secondary result of its action on the local tuberculous lesions, but mostly the writers believe owing to the inherent toxicity of the drug.

B. L. Brock¹⁰ states that from the theoretical point of view it would appear likely that the best results from sanocrysin treatment would be seen in cases of the exudative type of lesion. This is typically met with in the negro, so negro patients were included in those chosen for treatment. Out of 46 cases (17 negro and 29 whites) treatment was discontinued in 6 owing to complications: 40 of the cases were treated intravenously, and in 6 the drug was injected into the pleural cavity. Of these 6, 5 were whites, and all experienced a greatly increased feeling of well-being. All had a purulent fluid with tubercle bacilli, and the effect of sanocrysin was greatly to increase the intervals between tappings and to reduce the number of bacilli. All the white patients did remarkably well with sanocrysin treatment, the exudative lesions showing moderate to marked clearing on X-ray films. With the negroes the results were disappointing, and the writer suggests that Gravesen's view that the cases selected for sanocrysin should be as far as possible in a condition resembling that of the recently infected animal must be modified. The acuteness of the lesion does not appear to be the chief requisite in selecting cases; a certain amount of immunity must also be present.

E. H. A. Pask¹¹ has given sanocrysin to 36 adult sanatorium patients. He states that no rigid system of dosage can be laid down. The dosage should be regulated by the reaction of the patient. In an undersized person with poor resistance and unsteady temperature the initial dose is very small—0.025 grm., and in the average case 0.05 grm. In the absence of reactions the dose is gradually increased to 0.75 grm., the total amount given being 5 to 6.5 grm. The smaller doses are given at intervals of four to five days, and larger doses at intervals of seven to ten days. An uneventful course takes twelve to fifteen weeks, but some cases take much longer. Patients are kept in bed for twenty-four hours after each injection. Reactions may be severe at times but usually clear up quickly. Albuminuria occurs in a large proportion but is usually slight; occasionally the urine may be laden with albumin. Diarrhoea is frequent, so the drug is contra-indicated in tuberculous enteritis. Vomiting may occur. Headache is common, and superficial ulcers of the mouth and lips are by no means rare. A variety of rashes may be caused. Erythema is common, and may be local or general; it is often associated with itching and followed by desquamation. A most troublesome case was one in which several toes of both feet became gangrenous, associated with severe cramping pains along the course of the arteries of the legs. This condition persisted for months, but eventually cleared up. The pains, however, persisted for over a year. The symptoms suggested an obliterative endarteritis. Another patient had severe herpes on the neck, spreading to the scalp and shoulder and followed by deep ulceration and scarring. Of the 36 patients, 8 did not complete the course owing to severe reactions. In one of these the treatment appeared to do definite harm. Of the remaining 28, 25 had a positive sputum. The results showed 22 improved and 6 stationary. Of the 25 with positive sputum, this became negative in 18. There was a tendency for the temperature and pulse to become steadier. The sedimentation test also showed evidence of improvement. Weight was lost in 66 per cent, as might be

expected with a drug possessing toxic properties. Of 15 in whom treatment was completed a year or more ago, the present condition is good in 2, improved in 2, stationary in 6, unsatisfactory in 4, and 1 died. Of the 14 survivors, 6 only are fit for work. The writer considers these figures compare favourably with the cases discharged after ordinary sanatorium treatment, especially as the cases were chosen because they were not improving under the ordinary régime and were unsuitable for artificial pneumothorax.

L. E. Houghton¹² has studied the blood changes in patients under sanocrysin treatment in order to find a method of assessing the value of the treatment. In 50 cases 800 blood examinations were made. An examination was made before treatment, twenty-four hours after injection, and then at intervals of four to six weeks during the course. Each test consisted of: (1) The sedimentation rate; (2) The total white count; (3) The differential white count; and (4) The von Bonsdorff count. The last consists in enumerating the total number of separate nuclei present in the first 100 polymorphonuclear neutrophils. The author considers that in a general way the differential count indicates potential resistance to the disease, and the sedimentation rate and von Bonsdorff count indicate the condition of the patient as the result of the disease. By an ingenious method the various tests are expressed as a single index figure. It was found that roughly patients undergoing treatment fell into two groups according to their immediate reaction to an initial dose of sanocrysin (0.1 or 0.25 gm.).

	GROUP A	GROUP B
Total leucocytes	Increased	Decreased
Total lymphocytes	Increased	Decreased
Total monocytes	Decreased or slightly increased	Greatly increased
Sedimentation rate	Decreased	Increased

Cases which ultimately did well tended to fall into Group A, whereas those which failed to improve constantly fell into Group B. There was evidence that a sufficient period of time was not ordinarily allowed to elapse between doses. Certain results showed that the influence of an injection is still evident after fourteen days. Equally marked changes in the hæmogram were produced by doses of 0.1 gm. as by doses of 0.5 gm.

The hæmogram is formed as follows. The importance of the differential count lies in the ratio between the neutrophils, lymphocytes, and monocytes. In a case of good prognosis the poly-lymph ratio tends to be smaller than the lymph-mono ratio, and the reverse is the case in active tuberculosis. If the difference between the percentages of polymorphonuclears and lymphocytes be x and the difference between the percentages of lymphocytes and monocytes be y , then $x - y$ will give a figure which represents the variation between the two ratios. This may be a positive or negative quantity—e.g., in a case with polymorphonuclears 72, lymphocytes 16, and monocytes 12, x is 56 and y is 4, so that $x - y$ is +52. The figure representing the sedimentation rate is added to this and the total is subtracted from the von Bonsdorff count—e.g., if the sedimentation rate is 56 and the Bonsdorff count 149, the index is $149 - 108$, i.e., 41. Variations in the index figure between zero and approximately 300 represent variations in the pathological condition of the patient. Patients with an index under 100 did not tend to improve under sanocrysin treatment. The higher the initial index, the more rapid and sure the improvement. The immediate cellular response to sanocrysin constituted either a temporary improvement of the blood-picture or a temporary deterioration. Cases with an initially good index tended to react favourably and vice versa. The sedimentation rate showed in certain cases an immediate but temporary improvement after an injection. This was regarded as a good response. The

sedimentation rate tended to improve gradually with the rest of the hæmogram in satisfactory cases. Sanocrysin rashes were always accompanied and in some cases preceded by an eosinophilia. In selecting cases for gold treatment it is suggested that a preliminary blood examination should be made to determine the index and that the immediate response to an initial dose should be ascertained. An index below 100 and a bad immediate response are contra-indications to treatment. On the evidence of blood changes small doses (0.1 grm.) were found as efficacious as larger doses (0.5 grm.), and the writer believes that better results can be obtained by extending the interval between doses to fourteen days.

[Although sanocrysin has not realized the early expectations of its value it has a useful but limited rôle in the treatment of pulmonary tuberculosis. A suitable system of dosage for most patients which avoids extremes in both directions is to begin with 0.1 grm. and gradually increase—0.2, 0.35, 0.5, 0.65, 0.8, 1 grm.—with an interval of three days between the first and second doses and a week between the following doses. If any reaction occurs after a dose a pause must be made until all effects of the reaction have passed off, and then the same dose should be repeated. The final dose, which may be 0.8 or 1 grm., should be repeated two or three times. The total dosage is about 5 grm. The course can be repeated after an interval of two months. There is general agreement that sanocrysin has a marked effect in reducing the amount of sputum and the number of tubercle bacilli contained in it. In my experience its most useful applications are: (1) in checking the exacerbations of disease which occur from time to time in the course of a chronic case; (2) in cases of artificial pneumothorax in which there is some active disease in the uncollapsed lung; (3) in patients with slowly progressive disease who are not improving under ordinary methods of treatment.—W. II. W.]

REFERENCES.—¹*Arch. of Internal Med.* 1931, Nov., 734; ²*Johns Hopkins Hosp. Bull.* 1932, July, 41; ³*Arch. of Internal Med.* 1932, Jan., 77; ⁴*Ibid.* June, 957; ⁵*Jour. of State Med.* 1931, Sept., 526; ⁶*Jour. Indust. Hygiene*, 1930, xii, 108; ⁷*Lancet*, 1931, ii, 954; ⁸*Ibid.* 1344; ⁹*Amer. Rev. Tuberc.* 1931, xiv, 401; ¹⁰*Ibid.* 436; ¹¹*Lancet*, ii, 1346; ¹²*Tubercle*, 1932, June, 385.

TUBERCULOSIS, PULMONARY: SURGICAL TREATMENT.

A. Tudor Edwards, M.Ch., F.R.C.S.

There is no question that the treatment of pulmonary tuberculosis by one or other form of pulmonary collapse is being recognized to an ever-increasing degree and is resulting in an enormous increase in the literature on the various forms of therapy with this end in view. As is not uncommon, many measures are proposed with the object of drawing attention to the individuals proposing them rather than with the hope of any substantial improvement in the chief operations which have been practised for some years.

Artificial Pneumothorax.—Obviously artificial pneumothorax is the operation which can be performed with the least general disturbance to the patient considering the extent of the collapse produced, and has therefore been practised probably to a greater extent than any of the others. For this reason it is useful to review some of the results obtained after a fairly long period of observation. E. N. Packard¹ recalls the present status of 103 patients submitted to artificial pneumothorax therapy one to eighteen years after the lung has expanded. He states that the average period of treatment was 2.6 years, and, of the 54 patients working, one-half stopped treatment as a matter of choice and in the other half it was impossible for various reasons to continue the treatment. Of the total of 103 patients 81 are alive, of whom 62 are working or leading normal lives and the remaining 19 are still under treatment. In a somewhat similar group of patients who underwent sanatorium

treatment but no collapse therapy, 69 per cent were dead at the end of five years. In Packard's view effective pneumothorax for two years' duration and negative sputum for at least a year is a reasonable assurance that the lung has expanded with safety. These cases are obviously taken from the favourable group of pneumothorax patients in whom pulmonary collapse is almost, if not absolutely, complete.

Cauterization of Adhesions.—When collapse is partial and the lung is held out by adhesions of a reasonable size, cauterization of the adhesions by endoscopic methods will result in complete collapse in a large proportion of favourable cases. Unfortunately the successful collapse of the lung by this method does not inevitably lead to good results in more than a small proportion of the cases. A. Heymer,² in a report on 200 cases of cauterization of adhesions, notes that 25.4 per cent were cord-like, 66.7 per cent membranous, and 7.9 per cent broad and sheet-like. In the operations a good collapse was obtained in one-half of these and a partial collapse in over one-third. The clinical results did not correspond, there being 9 per cent improved, 74 per cent moderately improved, and 16 per cent unaffected. The operation appeared to be more successful in eliminating tubercle bacilli from the sputum, for before operation the sputum was positive in 91 per cent, whereas after operation only 32 per cent had positive sputa. One of the objections put forward to this procedure is the risk of pleural effusions. Minor effusions consisting of a trifling exudate in the costo-phrenic sinus occurred in 88 per cent of patients but was reabsorbed in about ten days. In 7 per cent there was a large effusion, which in two cases went on to empyema.

Open operation to divide adhesions has been largely abandoned by most surgeons owing to the risks of persistent sinus. L. Hoscman,³ in spite of its past history, again advocates this method but uses a diathermy electrode for the severance of the adhesion. This method of division much diminishes the risk of hæmorrhage, which, in his opinion, is a common precursor of an infected empyema. The operation does not appear likely to give better results than those obtainable with the endoscopic method, and for this reason is unlikely to attain much popularity.

Phrenicectomy.—This procedure has now attained a definite place in the treatment of pulmonary tuberculosis, in certain suitable cases as the sole measure, in others as a complementary operation to pneumothorax, pneumolysis, or thoracoplasty. H. Mues,⁴ in analysing 65 cases at intervals of from four to ten years after operation, concludes that with lower-lobe processes phrenicectomy as the sole measure often gives excellent results. In cases of upper lobe lesions it is common to get amelioration.

A. Neddermeyer and G. Walther,⁵ in a larger series but over a shorter period, have studied the effect of phrenicectomy in cases with cavitation. In 80 out of their 100 cases cavities were present and 95 had tubercle bacilli in the sputum, but the lesions were unilateral in only 33 cases. There was improvement clinically and radiologically in 77 per cent, and this was closely commensurate with the degree of ascent of the diaphragm. Unquestionably the type of the lesion is of definite importance in this operation, as it is unreasonable to expect collapse of apical cavities which are long-standing and situate in the midst of a mass of fibrous tissue. The only value of phrenicectomy in these cases is as a preliminary to thoracoplasty.

J. Morin and R. Rautureau⁶ definitely advocate phrenicectomy for relatively fresh lesions in which pneumothorax is impossible, and emphasize that good results are only to be expected from this operation as a sole measure if the lesion is relatively fresh, relatively restricted, and the pleural space over the affected site is relatively free.

M. Iselin,⁷ in discussing *bilateral phrenicectomy*, records 7 cases done by other surgeons. It is unlikely to be an operation of more than extremely limited use for tuberculosis.

Apicolysis, in which localized collapse of the upper part of the lung is produced by separating the lung and adherent pleural layers from the upper chest wall, has been much advocated in the past, particularly by German surgeons. Theoretically it has much to commend it, but one of the difficulties has been to find a suitable substance to fill the space created between the upper chest wall and the apex of the lung. Fat, lipomas, muscle, and foreign bodies such as sterile paraffin wax have been employed, but the last is the only substance which has been used on a wide scale.

W. Denk,⁸ after an experience of 80 cases, is rather disappointed with this operation, giving in his results 7 deaths and 7 improved. This seems an enormous mortality for this procedure, and, as he states, is unjustified if it was only performed where the lesion was localized to the upper lobe. In 2 of his cases severe infection of the extrapleural space resulted and in 2 others rupture of the wax into the cavity took place with eventual external fistulae. It would certainly appear that if these figures are to be taken as indicative of the results obtainable, the operation would have no place in treatment of this disease. Other authors, such as W. Felix and W. Mindus,⁹ although agreeing that complications do occur occasionally, advise the operation for patients with relatively small upper-lobe cavities in whom the surrounding lung is almost unaffected and on whom pneumothorax and phrenicectomy have been unsuccessful and for whom thoracoplasty is too formidable to promise success.

W. Sachs and W. Sperl¹⁰ go so far as to advise apicolysis in bilateral lesions when pneumothorax is impossible and one side has a rigid cavity resisting closure. Similarly, they advise this operation in patients with upper-lobe cavities and in whom thoracoplasty is contra-indicated. Other authors, such as H. Boit and H. Scholz,¹¹ consider this operation preferable to thoracoplasty in cases of upper-lobe cavities with widespread adhesions, and especially where there is little involvement of the remainder of the lung, and, in addition, advocate the use of the operation as complementary to thoracoplasty where the latter has failed to obliterate an apical cavity—an indication with which most thoracic surgeons would agree.

It is essential to bear in mind that the operation of apicolysis requires a very high degree of asepsis to prevent certain of the complications, and it should never be performed for cavities in which the outer wall is very thin and in which, therefore, the blood-supply arises largely from secondary vessels between lung and chest wall. Division of these vessels is liable to cause necrosis of the external wall of the cavity, resulting in infection of the wax bed as an early complication, or in the slow penetration of the wax into the cavity and its partial evacuation through the bronchi.

Thoracoplasty as a major surgical procedure is naturally regarded as a much more formidable operation, but by modern technical methods has been so much improved that the mortality has been reduced well below that of other more generally accepted operations. Necessarily, this operation requires a somewhat specialized experience, more particularly in its indications and contra-indications. O. Schedtler¹² would advise thoracoplasty in cases of well-localized sclerotic tuberculous cavities and where pneumothorax fails to collapse these. He would also perform thoracoplasty for serous or pleural effusions arising in the pleura during pneumothorax treatment; where residual cavities or large pyopneumothoraces persist and cannot be closed by other means, and in serious hæmoptyses, where pneumothorax is impossible or

ineffective. Where sclerosis has resulted in gross displacement of the mediastinal structures and caused cardiac distress the operation will allow these structures to return relatively to their normal position and thereby relieve symptoms. In bilateral lesions Schedtler would perform thoracoplasty only if the bad lung is not seriously damaged and the disease in the 'better' lung shows no evidence of progression after two months of observation. The outstanding indication is a predominatingly unilateral, widespread lesion. As regards gross contra-indications, agreement is general that rapidly progressive exudative lesions in the lung, myocardial degeneration with poor circulatory tone, and multiple tuberculous lesions are prohibitive. Age, especially over sixty, is a definite bar, as is emphysema or progressive disease of the opposite lung. The extent of localized lesions in larynx and genito-urinary tract that is permissible varies with different surgeons.

Statistics as to immediate and remote results must necessarily vary owing to factors such as choice of patient, technique (including anaesthesia), and whether multiple-staged or not. P. Bull¹³ gives a mortality of 11 per cent, and of 200 cases operated upon between the years 1914-29, 129 are still living (of whom 87 are cured), 67 are dead, and 4 cannot be traced. Denk, in 175 thoracoplasties, records an early operative mortality of 16.6 per cent and a late mortality of 21.2 per cent. Schedtler has performed 320 thoracoplasties: 80 were done in one stage and 240 in two stages. In the first eight post-operative weeks, 17 died (5.3 per cent); in 239 cases operated upon for unilateral cavernous tuberculosis only 8 died.

H. Proust and L. Maurer,¹⁴ in order to aid obliteration of juxta-hilar cavities, advise removal of the transverse processes up to the bodies of the vertebrae, and state that the only contra-indications are severely infected pleural lesions or bronchopleural fistulae which may result in infection of the vertebrae. This procedure must obviously increase the severity of the operation, and the outcome is likely to be doubtful. Other methods can attain the same objects by less drastic means, and under these circumstances resection of the transverse processes is not to be recommended at the present time.

REFERENCES.—¹*Jour. Thor. Surg.* 1932, Aug., 581; ²*Zeits. f. Tuberk.* 1930, lix, 37; ³*Tag. d. Deut. Ges. f. chir. Sitzg.* 1931, viii, 11; ⁴*Deut. Zeits. f. Chir.* 1931, cccxxiii, 20; ⁵*Munch. med. Woch.* 1931, March 20, 476; ⁶*Rev. de la Tuberc.* 1931, xii, 593; ⁷*Médecine*, 1931, May, 389; ⁸*Beitr. z. Klin. d. Tuberk.* 1931, May 3, 77; ⁹*Deut. Zeits. f. Chir.* 1931, Sept., 1; ¹⁰*Beitr. z. Klin. d. Tuberk.* 1930, lxxiv, 168; ¹¹*Zeits. f. Tuberk.* 1931, lxi, 193; ¹²*Deut. med. Woch.* 1931, March 20, 491; ¹³*Ibid.*; ¹⁴*Bull. et. Mém. Soc. nat. de Chir.* 1931, lviii, 1292.

TUBERCULOSIS, RENAL. (See KIDNEY, SURGERY OF.)

TUBERCULOSIS OF THE SMALL INTESTINE. (See INTESTINES, SURGERY OF.)

TUBEROSE SCLEROSIS (EPILOIA).

Macdonald Critchley, M.D., F.R.C.P.

Precisely how many distinct pathological entities exist under the clinical guise of epilepsy and mental defect is problematical, but doubtless there are many. One of the most sharply demarcated is that syndrome known generally as tubero (or tuberous) sclerosis. Originally described as a pathological curiosity, by Hartdegen, Bourneville, and others, it gradually became realized that diagnosis was possible during life. We now recognize that the typical clinical picture consists in a combination of mental defect, epilepsy, and curious skin lesions. To this complete syndrome the term 'epiloia' has been applied. It is certain, however, that incomplete variants may occur, so that any one or even two of the well-known symptoms may be absent.

Tuberose sclerosis is a rare disorder and is scarcely ever encountered in its fully developed form outside an institution. A recent study by M. Critchley and C. J. C. Earl,¹ based upon 29 personal cases, sets out the clinical and pathological features as follows:—

The affection is usually an heredo-familial one, and even when no other case of tuberose sclerosis can be traced among the relatives, a familial psychopathic taint is usually obvious. If not actually congenital, the symptoms appear almost always within the first year or two of life.

Mental Defect.—The child may be late in attaining the milestones of its development, and during the second or third year may begin to lose ground. Frequently the child has never learned to speak. The backwardness advances through various stages of imbecility, usually to the profoundest idiocy. Frequently, and more particularly in the higher-grade patients, psychotic traits are evident, and such patients present many of the physical stigmata of schizophrenic states, with catatonia, attitudinization, and curious complicated gestures and movements of the hands. In the lower-grade sufferers the idiocy may be so profound as to render the patient almost completely out of touch with his environment and incapable of spontaneous activity.

Epilepsy.—Periodic convulsions punctuate the progressive deterioration. The fits are often antedated by purposeless bouts of screaming or of temper. There is a great irregularity in the occurrence of the epileptic attacks, and remissions of months or years are not rare. On the other hand, the fits may be so numerous that a hundred or more may occur in sequence, and indeed status epilepticus is the usual mode of death in epiloiacs. It is perhaps noteworthy that no parallel can be traced between the number of fits and the rapidity of the dementia.

Skin Lesions.—The most obvious and the best-known dermatological lesion in tuberose sclerosis comprises the appearance of *adenoma sebaceum* on the nose and cheeks. In this way the diagnosis can be made at sight. Whether all cases with adenoma sebaceum under the care of dermatologists actually constitute *formes frustes* of tuberose sclerosis is not known, but it is noteworthy that a familial incidence and a frequent occurrence among subnormal persons have been noted by those interested in skin diseases. The adenoma sebaceum in cases of epiloiia usually dates from early in life, but follows the first mental symptoms; at puberty the skin lesion usually increases with some rapidity. Other types of cutaneous affection occur, but their situation on the trunk or limbs accounts for their escaping notice. Among these associated changes may be mentioned 'shagreen patches' on the loins, i.e., areas of raised and roughened skin. Other lesions closely resemble those found in von RECKLINGHAUSEN'S DISEASE (q.v.), and include fibromata, molluscum fibrosum pendulum, café-au-lait patches, pigmented areas, vitiligo, and nævi. (Plates LVII, LVIII.)

Morbid Anatomy.—The pathological appearances in this disorder comprise two distinct types of lesion—namely, circumscribed cerebral areas of sclerosis, and the occurrence of primitive types of tumour in the viscera.

Cerebrum.—Scattered over the cerebral cortex are a number of pale, intensely hard areas, each about 1 cm. in diameter. They are much less obvious on inspection than on palpation, when they attract attention by their firm, almost cartilaginous consistency. The cerebellum, brain-stem, and spinal cord are usually free from such areas, but projecting from the basal ganglia into the lateral ventricles are typical sub-ependymal excrescences, spoken of as 'candle-gutterings'. The histological appearances of these cortical and sub-ependymal lesions comprise a neuroglial overgrowth, atrophy of many of the nerve-cell elements, and lastly the presence of unusual giant cells, which may recall

PLATE LVII
TUBEROSE SCLEROSIS
(M. CRITCHLEY AND C. J. C. EARL)

Fig. A. Case of tuberose sclerosis (epiloia) showing well-marked adenoma sebaceum of the face.

primitive types of neuron or glia cells. The intervening regions of the brain, though normal to the naked eye, reveal under the microscope similar changes to those in the morbid areas, though less intense in degree.

Visceral Tumours.—The second characteristic pathological feature comprises multiple tumours of the viscera, especially in the kidneys and heart, but also at times in the intestine, spleen, and thyroid. Various histological descriptions have been applied to these, but they all agree in that they concern an overgrowth of the most primitive elements of the tissue from which they grow.²

Nature of the Disease.—It is probable that tuberosc sclerosis comprises a developmental anomaly commencing early in fetal life. An association between tuberosc sclerosis and von Recklinghausen's disease has been hinted at during the past twenty years. Thus, both disorders are characterized by striking cutaneous appearances, the pigmentary disorders, naevi, café-au-lait patches, and fibromata being common to them both. Both are heredo-familial affections often associated with psychopathic trends.

REFERENCE.—¹*Brain*, 1932, iv, 311.

TULARÆMIA.

J. D. Rolleston, M.D., F.R.C.P.

ETIOLOGY.—T. Thjøtta,¹ who reported the first cases of tularæmia diagnosed in Norway in 1930 (*see* MEDICAL ANNUAL, 1931, p. 490), describes the subsequent distribution of the disease and the various modes of infection in that country. Tularæmia is prevalent all over Southern Norway and as far north as Hattfjelldal. Only one case has been found in the western part of the country. From November, 1929, to November, 1930, Thjøtta had diagnosed about 50 cases, and the number was still rising. Most of them had occurred in hunters who had opened hares with unprotected hands, as well as in kitchen maids and game dealers. The two latter, who do not handle the hare until after its preservation in cold storage, contract a less severe attack than hunters, who remove the intestines directly after killing it and so become infected with a fully virulent micro-organism. Keepers of fox ranches, who skin the animals and remove the intestines, are also often infected. In cases in which there is no history of contact with hares, the infection has probably been due to lemmings which overrun certain districts of Norway. No case of tularæmia due to the bite of an insect has been observed in Norway.

S. M. Kaufman² records the fourth case of tularæmia to be reported from New York State, the patient being a woman who had infected her right index finger by skinning rabbits.

SYMPTOMS AND COMPLICATIONS.—The frequency of *pulmonary lesions* in tularæmia is illustrated by S. D. Blackford,³ who states that in more than a third of 24 fatal cases collected by Francis in 1928 a diagnosis of intercurrent bronchopneumonia had been made. In 1931 Blackford reported 13 cases of tularæmia, 6 of which presented signs of intrathoracic disease, such as pleural effusion, bronchopneumonia, bronchitis, or lung abscess. He now records a case in a man of 38 who was probably infected by an opossum. Post mortem multiple pulmonary thrombi were found accompanied by areas of necrosis, and were sufficient to account for death. Gross caseous nodules were lacking in the liver and spleen.

M. Foulger, A. M. Glazer, and L. Foshay,⁴ who report a personal case, have found records of only eight previous necropsies in tularæmia. Their case was that of a woman, age 37, who developed the disease four days after skinning rabbits. No benefit was derived from injections of convalescent serum. Death was preceded by symptoms of peritonitis and coma. The necropsy showed numerous tularæmic abscesses in the lungs, liver, spleen, and lymphatic glands,

pulmonary congestion and early lobular pneumonia, fibrinous peritonitis, subacute enteritis, and toxic nephrosis.

J. O. Hazlip and A. E. O. Neil⁶ report the case of a man, age 45, who developed *meningitis* secondary to a sore on the left thumb, from which *B. tularensis* was isolated as well as from the turbid cerebrospinal fluid. The blood serum agglutinated *B. tularensis* in a dilution of 1-40. Typical tularæmia with characteristic lesions was produced in guinea-pigs by inoculating them with the exudate from the thumb and cerebrospinal fluid. With the exception of five fatal cases of tularæmia reported by Francis which terminated with meningeal symptoms no previous example of meningitis due to *B. tularensis* has been recorded.

TREATMENT.—L. Foshay⁶ treated ten cases of tularæmia with a **Serum** prepared from a goat inoculated with formaldehyde suspensions of *B. tularensis*: 10 c.c. were usually given intravenously on both the first and second days in hospital. No serum reactions occurred. Nine patients showed abrupt cessation of fever, malaise, arthralgia, and myalgia forty-eight hours after the second injection, and a rapid reduction in size of the affected lymphatic glands, none of which suppurated. Only one patient, who was moribund on admission, died. The serum therefore promises to be a potent and reliable treatment for tularæmia.

REFERENCES.—¹*Jour. of Infect. Dis.* 1931, xlix, 99; ²*N. Y. State Jour. of Med.* 1931, xxxi, 1499; ³*Ann. of Internal Med.* 1932, v, 1421; ⁴*Jour. Amer. Med. Assoc.* 1932, xcvi, 951; ⁵*Ibid.* 1931, xcvi, 704; ⁶*Ibid.* 1932, xcvi, 552.

TYPHOID FEVER. (See also PARATYPHOID FEVERS.)

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—The twentieth annual report of the *Journal of the American Medical Association*¹ on the cities of the United States with a population of more than 100,000, of which, as in 1930 (see MEDICAL ANNUAL, 1932, p. 559), there were 93 in 1931, shows that the total typhoid mortality-rate in 78 cities whose records are available for the whole 21-year period is almost exactly the same as for the two preceding years. It is too soon to conclude that a stable period in the urban typhoid rate has been reached for the whole country. It appears, indeed, more probable that a further decline will take place. In 12 of the 93 cities no typhoid deaths occurred in 1931, this being the largest number of cities with perfectly clear records ever reported by the journal.

P. Melnotte² in a paper on enteric fever in Morocco records his observations on 787 cases seen in the hospitals at Marrakech and Fez during the period 1921-7. The varieties and case-mortality were as follows: typhoid 312 cases with 65 deaths (20.83 per cent), paratyphoid A, 441 cases with 19 deaths (4.30 per cent), and paratyphoid B 34 cases with 4 deaths (11.76 per cent). The two principal epidemiological features of enteric fever in Morocco are: (1) Endemic occurrence due to faecal contamination of the soil and water, abundance of flies, and the defective hygiene of the mixed native and European population; (2) Frequent association with other diseases, especially anæmic dysentery, malaria, and leishmaniasis.

A water-borne epidemic of typhoid fever at Ecclefechan (Carlyle's birth-place) affecting .55 per 1000 of the inhabitants, with two deaths, is reported by J. Ritchie and E. Armstrong.³ The evidence available showed that the public water-supply was the vehicle of infection, and a typhoid carrier was found in the water-collecting area. Examination of the water pipes showed that surface pollution might gain access to the pipes conveying water to the collecting tank. Secondary cases were few, and there was no evidence that foci of infection remained as sequelæ of the outbreak.

ETIOLOGY.—Carrieu and Pappas⁴ illustrate the importance of shell-fish in

the causation of typhoid fever by the fact that during the period 1926-30 the proportion of cases in the Montpellier region attributable to shell-fish ranged between 42.5 and 55.6 per cent. Similar observations were made by Loir and Legagneux at Havre in 1928, when 21 deaths among 56 cases of typhoid fever were due to eating mussels. Oysters are not the only shell-fish responsible for the transmission of typhoid, but other shell-fish also play an important part, such as mussels, cockles, whelks, and winkles. The contamination of shell-fish is specially liable to occur at the estuaries of rivers, where the excreta of the inhabitants as well as of the occupants of ships in the harbour are discharged. Contamination may also be produced by the water used by salesmen to give a fresh appearance to their wares. The presence of typhoid bacilli in the shell-fish may last as long as thirty-four days, and their number may be increased at any time by variations in the temperature.

SYMPTOMS AND COMPLICATIONS.—K. Röper⁶ illustrates the rarity of *hæmorrhagic typhoid fever* by the fact that Curschmann, among 2000 cases of typhoid, saw only 6 examples, which were characterized by hæmorrhages in the skin, and usually from the nose, gums, intestine, kidneys, and serous membranes. All died. Röper reports a case in a youth of 17 who on the twenty-sixth day of a severe attack of typhoid developed numerous hæmorrhagic bullæ on the malleoli, iliac spines, and ribs. There was a leucopenia of 1555 and a thrombopenia of 28,032. The stools were loose and black, but no other hæmorrhages were noted. Death occurred on the thirtieth day of disease. Post mortem no hæmorrhages were found in the viscera or serous membranes except in the ileocecal region and ileum.

A. Peroni⁶ reports a fatal case of *oto-typhoid* in a man of 20. The symptoms were chronic inflammation of the middle ear, complicated by meningitis and an abscess in the inferior temporal convolution with dilatation of the lateral ventricles. The cerebrospinal fluid was turbid and showed *B. typhosus*. The Widal reaction was positive in 1-250. No lesions, however, were found in the intestine post mortem, and there was no previous history of typhoid. The case, therefore, was one of primary infection of the middle ear with the typhoid bacillus, which had acted like an ordinary pyogenic organism.

Bacaloglu, Dumitresco-Mante, and Ciorapeiu⁷ state that while a single relapse in typhoid fever is relatively common, being found in from 3 to 10 per cent of all cases, multiple relapses are rare. Of 65 relapses which occurred among 1550 cases of typhoid fever reported by Podanovsky, only 2 were multiple. Bacaloglu and his colleagues now relate the second case to be recorded of five relapses, the first having been published by Jaccoud in 1901. In the first three relapses the period of apyrexia was three days, while in the last two it was a little more than a week. In each relapse the symptoms were exactly like those of the primary attack.

B. B. Vincent⁸ reports a case of *hepato-cholangitis*. The patient was a man, age 52, who had been a typhoid carrier for twenty-six years, during which he was operated on for several monthly attacks of pain in the upper right quadrant of the abdomen and recurrent jaundice. Marked cholecystitis and a small contracted gall-bladder containing numerous stones and some pus were found. Cholecystectomy was performed, but the abdominal pain persisted, and an abscess in the right rectus muscle containing *B. typhosus* was evacuated. Subsequently biliary drainage was carried out on fifteen occasions and complete recovery took place, the typhoid bacilli diminishing in number and finally completely disappearing from the bile.

Non-suppurative mastitis, of which J. Sabrazès⁹ records an example, is an uncommon complication of typhoid fever, being rarer than suppurative mastitis. It is most frequent in females between the ages of 20 and 45. It usually

develops as the temperature is falling or at the beginning of convalescence. It is as often confined to one side as it is bilateral, in which case one gland is affected after the other and not both simultaneously. It is of short duration, subsiding in from eight to twenty days.

M. Brulé, P. Hillemand, and E. Gilbrin¹⁰ describe a case of *acute vulvar ulcer* due to *B. crassus* in a virgin, age 18, occurring at the onset of typhoid fever. The gangrenous appearance of the lesions and the severe constitutional disturbance at first suggested gangrene of the vulva, but the correct diagnosis was established by isolation of typhoid bacilli from the blood. Recovery took place under treatment by intravenous injections of **Trypaflavine**.

According to J. G. Perrachon,¹¹ who records 11 cases in patients aged from 8 to 54, *B. coli pyelonephritis* is an uncommon complication of typhoid fever. It may occur at two distinct stages of the disease—namely, about the third week, or in convalescence, when two varieties of it may be found: (1) The ordinary acute form, characterized by rise of temperature, accompanied or followed by lumbar pain and pyuria, and a favourable course; and (2) A form with bacteriuria, characterized by morphological changes in the urine and the presence of *B. coli*uria.

E. Cantegril and G. Rienau,¹² who report a case of pneumococcal empyema occurring in the fourth week in a man, age 25, who recovered after operation, state that *pleurisy* is a rare complication of typhoid fever, being met with in only 2 per cent of all cases. It may be due to organisms of the enteric group, pyogenic organisms, anaerobes, or the tubercle bacillus either alone or in combination. As a rule the pleurisy is serofibrinous and is readily absorbed, but it may be hæmorrhagic, especially when caused by *B. typhosus*, or purulent. There is nothing specific in the cytological reaction of the effusion. The prognosis is favourable except in empyema, where it is grave.

L. K. Wang and L. J. Miltner¹³ illustrate the rarity of *typhoid spine* by the fact that less than 150 cases have been recorded since it was first described by Gibney in 1889. In a series of 533 typhoid lesions of bone collected by Murphy in 1916 the spine was involved in 110, or less than 25 per cent. Most of the recorded cases have occurred in the male sex between the ages of 20 and 35. [The reviewer has seen a case in a man, age 70, who recovered.—J. D. R.] In the great majority the lumbar vertebræ or their adjacent soft parts are involved; lesions of the dorsal vertebræ come next in frequency, and only a few cases of involvement of the cervical vertebræ and sacro-iliac joints have been reported. Typhoid spine may occur late in convalescence or after the patient has resumed work, either spontaneously or as the result of an accident. The following forms are described: (1) Diffuse periostitis and perispondylitis, especially affecting the ligaments between the bodies of the vertebræ; (2) A localized or common type showing early destruction of the intervertebral disc with slight gibbus formation; and (3) An osteomyelitic type with rather extensive affection of one or more vertebræ and resulting gibbus formation. The prognosis is almost always favourable, complete recovery taking place in a few months under treatment by immobilization in a bi-valved plaster-of-Paris jacket until all pain has disappeared, when the patient should be allowed to walk with a Taylor's spinal brace.

TREATMENT.—The value of **Transfusion** in typhoid fever is emphasized by Z. Lewkowicz¹⁴ and M. Determe.¹⁵ In Determe's series of 67 cases in patients aged from 5 to 50, in 33 the blood of non-inoculated persons was used, in 23 the blood was taken from persons inoculated against typhoid, and in 11 the donors were convalescent from typhoid. Transfusion is specially indicated in severe intestinal hæmorrhage and is generally successful when other methods have failed, and also in relapsing and protracted forms of the disease.

Since his last paper on the subject (see MEDICAL ANNUAL, 1931, p. 408), A. Rodet¹⁶ has collected information about 275 typhoid patients treated by his *Serum*. He divides them into two groups, the first consisting of 169 cases in which the diagnosis was confirmed by bacteriological examination, and the second of 106 cases in which no bacteriological examination was made but the disease was probably typhoid fever. The total number of deaths in the two groups was 26—a fatality-rate of 9.4 per cent—19 of which occurred in the first group. The most striking effect of the serum was the improvement of the general condition which was caused by disappearance of the toxic symptoms and production of a state of euphoria. The chief cause of failure of the serum was a superadded infection with the staphylococcus, enterococcus, *B. pyocyaneus*, or malaria.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, xcviii, 1550; ²*Bull. Soc. Path. Exot.* 1932, 447; ³*Jour. of Hyg.* 1932, xxxii, 417; ⁴*Rev. d'Hyg.* 1932, 321; ⁵*Munch. med. Woch.* 1931, 2036; ⁶*Arch. Ital. di Otol.* 1931, 500; ⁷*Bull. Soc. méd. Hôp. de Paris*, 1932, 622; ⁸*Jour. Amer. Med. Assoc.* 1932, xcviii, 885; ⁹*Bull. Acad. de Méd.* 1932, cvii, 270; ¹⁰*Bull. Soc. méd. Hôp. de Paris*, 1932, 525; ¹¹*Thèse de Paris*, 1932, No. 215; ¹²*Gaz. des Hôp.* 1932, 351; ¹³*China Med. Jour.* 1932, 1; ¹⁴*Thèse de Paris*, 1931, No. 535; ¹⁵*Ibid.* 1932, No. 148; ¹⁶*Lyon méd.* 1931, cxlviii, 201, 225.

TYPHUS FEVER.

J. D. Rolleston, M.D., F.R.C.P.

ETIOLOGY.—H. A. Kemp¹ alludes to the opinion held by Maxey, Shelmire and Dove, and Dyer, Runreich, and Badger, that endemic or New World typhus is transmitted by the rat flea, and records the following experiments. Guinea-pigs inoculated with fleas removed from rats which had been trapped at a typhus focus developed lesions characteristic of endemic typhus. The animals on recovery were found to be immune to a strain of typhus virus obtained from the blood of an endemic typhus patient. Animals which were immune to the blood virus were also immune to the strain of rat-flea virus obtained by inoculation of guinea-pigs.

H. Zinsser and M. R. Castaneda² carried out experiments showing that the virus of Mexican typhus fever rectally injected into three varieties of ticks (*Dermacentor nitens*, an unidentified *Amblyomma*, and *Dermacentor andersoni*) would remain alive and potent for at least fourteen days. Injection of the viscera of these ticks always produced the fever, scrotal swellings, and lesions of the tunica vaginalis characteristic of Mexican typhus. Abundant typical Rickettsias were found as well as a few small brain lesions, and six guinea-pigs so infected proved immune to subsequent injection of virus which caused severe lesions in controls. The writers conclude that ticks, as well as lice, bed-bugs, and fleas, may convey typhus from an animal reservoir to man.

DIAGNOSIS.—According to J. Cukierman³ the early diagnosis of typhus during an epidemic is considerably facilitated by the knowledge of its prevalence in cases presenting the following symptoms during the first two days of the disease: (1) A sudden onset, with shivering and a temperature of 101.2° to 104°, followed by a remission on the second day and then a sharp rise and a bloated facies; (2) Hyperæmia of the conjunctiva; (3) A palatal enanthem consisting of about five to ten dark red spots; (4) The tongue sign, i.e., inability to protrude the tongue; (5) Violent headache, especially in the frontal region, with a more or less marked meningeal reaction; (6) An artificial eruption produced by dry cupping. The clinical diagnosis can be confirmed by the following laboratory reactions during the first few days of the disease: (1) Tingeing of the serum after coagulation of the blood *in vitro*; (2) Diminution of the chlorides in the cerebrospinal fluid; (3) A clear cerebrospinal fluid with ten to twelve large mononuclears and a few polymorphonuclears in each field.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1931, xcvii, 775; ²*Jour. of Exper. Med.* 1931, liv, 11; ³*Thèse de Paris*, 1932, No. 312.

TYPHUS FEVER, TROPICAL.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Forms of typhus occurring in warm climates continue to attract much attention. A good account of the American varieties is recorded by R. E. Dyer, A. S. Rumreich, and L. F. Badger,¹ who state that tabardillo, or Mexican typhus, has been present in the highlands of Mexico for many years, and may possibly have been introduced by the Spanish conquest. It was found by Anderson and Goldberger to be immunologically the same as Brill's mild form of typhus described in the United States in 1910, and shown by K. T. Maxey to be endemic in the south-eastern states as far as Texas and California. Rocky Mountain spotted fever of the western United States frequently gives the positive Weil-Felix reaction of typhus, but Ricketts showed that the two diseases are immunologically distinct. Recent work deals especially with the transmitting agents, which in the European form was shown by Nicolle in 1909 to be the body louse, but in Mexican typhus Maxey noted increased risk of infection in food-handling establishments, and he therefore suspected a rodent reservoir of the virus, and the present writers found 78 per cent of their typhus cases to be associated with rat infestation. Ricketts as early as 1906-1909 had demonstrated infection through ticks. Clinically the United States endemic disease is a somewhat mild form of typhus, but the rash is not evident in the negro, and the leucocyte count is usually normal. The serum of nearly all cases agglutinated *B. proteus* X 19 in dilutions of 1-80 and over, and intensive study of two strains showed no distinction between endemic typhus and Rocky Mountain spotted fever. In monkeys (*Mucacus rhesus*) five to twelve days' fever followed an incubation period of five to eight days with a rash chiefly on the face, and in rabbits fever and the typical serotal involvement occurred. In the eastern endemic type the cases occurred in the tick season; 48 per cent gave a history of tick bite within two weeks before onset of fever. Further, the virus has been proved to survive in the American dog tick, *Dermacentor variabilis*, through at least two moults, and the nymphs can transmit the infection. Epidemiological evidence also suggests the rat flea as a carrier, and the virus of endemic typhus has been obtained in guinea-pigs bitten by fleas caught on rats in typhus foci in Baltimore and Savannah. H. Mooser, M. Ruiz Castaneda, and H. Zinsser,² in a report on rats as carriers of Mexican typhus, have tested the suggestion of Maxey by catching rats in a part of Mexico City where typhus was prevalent and injecting sterile emulsions of their brains intraperitoneally into male guinea-pigs, with the result that two of the guinea-pigs gave reactions typical of typhus fever with testicular swellings showing the presence of Rickettsia bodies, and on inoculating rabbits the immunity reaction and Weil-Felix agglutination were obtained. The rats were therefore carriers of the disease.

W. E. Dove and B. Shelmire³ record experiments to prove the experimental transmission of endemic typhus from one guinea-pig to another through the bites of tropical rat-mite larvæ, and also that the infection may pass from female mites through their eggs to the larvæ, which are capable of infecting guinea-pigs. The Mexican endemic typhus has also been studied in that country by C. Nicolle and H. Sparrow⁴ side by side with the virus of African typhus taken out from Tunis by Nicolle, who first proved that European typhus is transmitted by the louse. After referring to the work of Mooser and others on Mexican typhus, they show that the Tunis and the Mexican viruses protect against each other in the case of inoculated guinea-pigs; these experiments will be continued in Mexico. Although the two forms of typhus show a great resemblance they differ in some respects, for in the Mexican disease the rash is more abundant and widespread, hæmorrhages and

epistaxis are more marked, but cerebral and cardiac symptoms are less severe and convalescence is shorter. It will therefore be important to test if the natural infection of the rat and the transmission of the disease by rat fleas in the case of the Mexican variety also applies to the European form of typhus. The typhus infection of rats differs from that with plague in producing only mild and rarely fatal fever, so that the rat fleas have no necessity to leave the infected rats to attack man, and infection of man from rats is likely to be exceptional. A. Netter⁵ also deals with the rôle of the rat in the spread of endemic typhus of Brill in the United States. He first gives a good summary of the literature of the subject, which he thinks proves the identity of the pathology and bacteriology of the New World endemic typhus and the Old World epidemic disease. As early as 1916 in an outbreak resembling Brill's disease among children in the absence of lice Netter suspected spread through rodents, as has since been proved to be the case in Mexican typhus. Dummer in 1930 showed that the United States typhus may also be spread by lice, and thus epidemic typhus may originate from the endemic form. The knowledge that both kinds of insects may spread the infection should be of use in controlling outbreaks of typhus.

A. C. Schulenburg⁶ reports an outbreak of louse-borne typhus in the Ventersdorp diamond field in South Africa, where the disease is not uncommon among the native population, and the spread was aided by great scarcity of water for ablutions. The mortality in 337 cases was 27 per cent. F. H. Scroggie⁷ records the occurrence of a typhus-like fever in the Port Elizabeth district of South Africa with notes of nine cases, in five of which a red macular rash was present, and the blood of all gave positive Weil-Felix reactions in dilutions of 1-50 to 1-100. Lice were only found on the members of one family, in which three cases occurred. W. S. McGillivray⁸ records his experience of Brill's disease in Western Australia, where it was first recognized at Perth in 1926 in connection with food stores, rats being suspected as carriers. During the past year 34 cases have been observed, mostly in the hot season of December to May. In one case a bacillus was grown from the sputum, which on injection into a Belgian hare produced a serum which agglutinated *B. proteus* X 19; this he thinks may be the cause of Brill's disease.

J. McDonald Troup and A. Pijper⁹ describe in South Africa a mild form of tick-bite fever which they consider belongs to the typhus group, as the blood of the patients agglutinates X 19, and, on injection into guinea-pigs, a typhus-like fever is produced and rickettsia-like bodies are found in the brains. The seat of the tick bite shows a red papule developing a black necrotic centre, which takes three weeks to heal, and a non-suppurating lymphangitis follows. Cases occur during the summer and are common around Pretoria. A red papular rash is frequent and the temperature curve resembles that of typhus. A relative lymphocytosis occurs without increase of the total leucocytes. A. Pijper¹⁰ reports on the agglutination curve in the above described cases, which shows a rise with *B. proteus* OX 19, OX 2 (and X, Kingsbury to 1-100) at about the end of the fever and also during convalescence.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1931, Aug. 29, 589; ²*Ibid.* July 25, 231; ³*Ibid.* Nov. 21, 1506; ⁴*Presse méd.* 1932, Jan. 27, 137; ⁵*Ibid.* Jan. 30, 161; ⁶*Jour. Med. Assoc. S. Africa*, 1931, Nov. 14, 704; ⁷*Ibid.* Dec. 26, 809; ⁸*Med. Jour. of Australia*, 1931, Dec. 5, 716; ⁹*Lancet*, 1931, Nov. 28, 1183; ¹⁰*Jour. Med. Assoc. S. Africa*, 1931, Aug. 22, 519.

ULCER, TROPICAL. (See TROPICAL ULCER.)

ULCERATIVE COLITIS. (See COLITIS, ULCERATIVE.)

UNDULANT FEVER. (See also FOOD AND THE PUBLIC HEALTH—Cow's MILK AND UNDULANT FEVER.)

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Cases of both the *B. melitensis* and the *B. abortus* types of undulant fever continue to be reported from various countries. S. Livierato¹ has published an interesting account of sporadic cases of the disease in Greece (where the first case was recorded in 1903 by Thomopoulos), and described it from 76 cases; only 7 per cent of the goats have been found infected, which is less than in most infected countries. The *B. abortus* type was also found in an epidemic form in Greece in 1927 in connection with dairies in Athens, and 20 to 30 per cent of the cows were infected. Milk and cheese were sources of infection to man in the *melitensis* form. The **Vaccine Treatment** is the only one which proved of value.

N. P. Jewell² reports the first case of human infection with the *abortus* type in Kenya. H. R. Leavell and H. L. Amoss³ report on the endermic reaction in *Brucella* infections, and conclude that it is of diagnostic value in some cases in which agglutination and blood cultures are negative, but it is not completely specific as it may occasionally prove positive in control cases. Representative strains of several types of *Brucella* should be used.

The prevalence of undulant fever in north-east Scotland has been studied by J. Smith⁴ by means of agglutinin tests for *B. abortus* and *B. melitensis* of all serums of fever cases submitted for Widal tests, and further bacteriological tests when possible of the blood of patients yielding positive agglutination reactions. He found that 11 of 373 sera agglutinated the *B. abortus* in a dilution of 1-100 or more, or 0.26 per cent. Among 1446 sera sent for Wassermann tests 8, or 0.5 per cent, gave similar *B. abortus* reactions. Blood cultures, etc., in suspicious cases indicated that 10 of them were *B. abortus* infections.

REFERENCES.—¹*Presse méd.* 1932, Feb. 6, 198; ²*Jour. Trop. Med. and Hyg.* 1931, Aug. 15, 261; ³*Arch. of Internal Med.* 1931, Dec., 1192; ⁴*Quart. Jour. Med.* 1932, April, 303.

URETER, SURGERY OF.

Hamilton Bailey, F.R.C.S.

Ureteric Colic.—It is important to realize that renal, or rather ureteric, colic can occur in cases of *urethral* obstruction. B. Lewis¹ considers that this form of ureteric colic, which often simulates the agony of a stone passing down the ureter, is due to regurgitation of urine from the bladder up the ureter. Bumpus and others insist that it is not due to regurgitation, but to peristalsis in a ureter endeavouring to overcome obstruction in the intravesical portion of its course—an obstruction caused by hypertrophy of the bladder, which in turn is the result of urethral obstruction.

Stones in the Ureter.—In order to help the passage of ureteric calculi *per vias naturales*, 1 to 3 fluid drachms of **Tinct. Ammi Visnaga** well diluted with water, taken three times per day before meals, is distinctly useful. This drug lowers the tonicities of the ureters and does not inhibit their peristaltic action; it is also a diuretic. In cases of impacted calculus, with a view to inhibiting spasm, a 1-5000 solution of **Visammin**, the active principle, may be injected into the ureter through a ureteric catheter. (K. Samaan.²) I. S. Tchernagak³ has found that combined **Pituitrin and Belladonna** is valuable in aiding the passage of ureteric calculi.

There are a number of excellent communications on the treatment of ureteral stones (A. M. Crance,⁴ J. D. Barney and R. Chute,⁵ H. C. Bumpus and G. J. Thompson,⁶ W. C. Stirling,⁷ S. I. Movitt,⁸ K. Laqua,⁹ and H. P. Winsbury-White.¹⁰) Many of these deal with cystoscopic manœuvres. The success

PLATE LIX

URETEROCELE

(J. C. AINSWORTH DAVIES)



Fig. A. Right-sided ureterocele: distended.



Fig. B. Right-sided ureterocele: collapsed.

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'British Journal of Surgery'*

which has attended non-operative procedure—and variously 50 to 90 per cent of cases are claimed to be amenable to these measures—is tending to cloud the horizon, with the result that there is too much unnecessary suffering and disastrous delay. E. L. Peirson¹¹ makes the statement that *ureteral stones can be treated safely by cystoscopic manipulations and drugs, only when they are small enough not to completely obstruct the flow of urine and when there is no infection present.*

Empyema of the Ureteral Stump.—Empyema of the ureteral stump is a possible complication after removal of a pyonephrosis if the ureter remains, especially when the latter contains a stone. The best treatment for this condition is **Ureterectomy**. After nephrectomy in tuberculous cases empyema of the ureteral stump is unusual. (E. Papain,¹² R. L. Dournmashkin,¹³ H. S. Jeck.¹⁴)

Ureteral Narrowing (Localized Ureteritis; 'Ureteral Stricture').—Whether 'ureteral strictures' really exist is not a new problem; unfortunately they are seldom demonstrable even with all the modern refinements of ureterography. D. M. Morison¹⁵ defends the claim that narrowing of the ureter is not an unusual, but a frequently overlooked, cause of obscure pain. Furthermore he has found that the condition responds to dilatation of the ureter with bulbous-ended ureteral bougies. G. L. Hunner,¹⁶ a well-known disciple of the doctrine of 'ureteral stricture', now claims that this nebulous lesion, together with its inevitable concomitant urinary infection, accounts for most, if not all, of those obscure cases previously diagnosed as essential hæmaturia. J. W. Struthers,¹⁷ who is not a believer, asks pertinently why a 'ureteral stricture' should give rise to *abdominal* pain rather than ureteric colic. Brand¹⁸ remarks that localized stricture of the ureter was diagnosed in only 4 out of 1000 cases examined at the Mayo Clinic.

Primary Neoplasms of the Ureter.—One hundred and eight cases are reviewed by Chauvin and Serati.²⁰ A leading sign in this affection is abundant bleeding after withdrawal of a catheter from the ureter. There are several good papers on this rare condition. (L. Caporale,²¹ E. Davis and A. Sachs,²² M. J. Renner.²³)

Ureterocele.—A ureterocele is due to obstruction of the ureteric orifice. Such obstruction is occasionally due to a stone, but more often from a pin-hole ureteric orifice, which is either congenital or acquired, unilateral or bilateral. The symptoms are those of ureteric colic and of bladder irritation, and the diagnosis is made by cystoscopy. The walls of a ureterocele are the colour of bladder mucosa. A series of ripples on the surface of the cyst can be observed as it fills up, and gradually it subsides like an air-balloon (*Plate LIX*). J. Carver²⁴ cured a patient with a ureterocele by opening the bladder suprapubically and snipping away the cyst wall. In this case the cyst contained a stone. Destruction of the cyst wall by **Diathermy** applied through a cystoscopic electrode is the most satisfactory method of treatment in most cases. (J. C. Ainsworth-Davies,²⁵ F. E. B. Foley.²⁶)

Transplantation of the Ureters into the Rectosigmoid.—This subject, which was dealt with fully in the MEDICAL ANNUAL for 1930 (p. 537), 1931 (p. 63), and 1932 (p. 563), has again received much attention in the literature (H. Cabot,²⁷ W. Walters,²⁸ P. N. Walker Taylor,²⁹ R. C. Coffey³⁰). Transplantation of the ureters offers the opportunity to relieve many patients of urinary leakage by substituting the rectum for the bladder as a urinary reservoir. The advantages of the one- and two-stage operations are discussed; the majority of writers favour a one-stage operation, using ureteric catheters. Many successful cases are recorded; perhaps the most impressive is that of a woman upon whom Coffey's operation was performed in 1923. She has been delivered

of two healthy children by Cæsarean section. The patient has had no sign of renal infection at any time.

Transplantation of the ureters in advanced malignant disease of the bladder is condemned by Nitch and several other writers who have tried it (see BLADDER, SURGERY OF).

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1932, Feb. 20, 609 and Discussion; *Med. Press and Circ.* 1932, June 22, 503; ²*Brit. Jour. Urol.* 1931, 296; ³*Zeits. f. urol. Chir.* 1930, Dec. 20; ⁴*Amer. Jour. Surg.* 1932, Jan., 120; ⁵*Jour. of Urol.* 1931, xxv, 173; ⁶*Surg. Gynecol. and Obst.* 1930, 1, 106; ⁷*Urol. and Cutan. Rev.* 1931, Sept., 547; ⁸*Ibid.* May, 312; ⁹*Arch. f. klin. Chir.* 1932, May, 220; ¹⁰*Lancet*, 1931, ii, 788; ¹¹*New Eng. Med. Jour.* 1932, June 16, 1243; ¹²*Bull. et Mém. Soc. nat. de Chir.* 1932, April 23, 580; ¹³*Jour. of Urol.* 1931, Oct., 553; ¹⁴*Surg. Gynecol. and Obst.* 1931, June, 1158; ¹⁵*Edin. Med. Jour.* 1931, Nov., 153; ¹⁶*Amer. Jour. Surg.* 1932, May, 279; ¹⁷*Zeits. f. urol. Chir.* 1931, April 23; ¹⁸*Edin. Med. Jour.* 1931, Nov., 156; ¹⁹*Ibid.* 160; ²⁰*Arch. Mäl. des Org. Gén-urin.* 1931, v, 631; ²¹*Urol. and Cutan. Rev.* 1931, June, 341; ²²*Jour. Amer. Med. Assoc.* 1931, June 20, 2096; ²³*Surg. Gynecol. and Obst.* 1931, April, 793; ²⁴*Brit. Jour. Urol.* 1932, 132; ²⁵*Brit. Jour. Surg.* 1932, April, 548; ²⁶*Urol. and Cutan. Rev.* 1931, Jan., 49; ²⁷*New Eng. Jour. Med.* 1931, Oct. 8, 706; ²⁸*Arch. f. klin. Chir.* 1931, Sept., 589; *Amer. Jour. Surg.* 1932, Jan., 15; ²⁹*Austral. and N.Z. Jour. Surg.* 1931, Sept., 158; ³⁰*Brit. Jour. Urol.* 1931, Dec., 354.

URETHRA, SURGERY OF.

Hamilton Bailey, F.R.C.S.

The Female Urethra.—Attention is so focused on the male urethra that affections of the female urethra are almost lost to sight. The lesions to which attention is drawn especially are:—

1. *Stricture.*—An adult female urethra which will not take a 20 French bougie is the seat of a stricture. The relief which sometimes follows cystoscopy is due to unconscious dilatation of a stricture. Gonorrhœa is the most frequent cause of stricture of the female urethra, but carcinoma is more common than is usually supposed. (M. W. King.¹)

2. *Granular Urethritis.*—This is recognized by the cysto-urethroscope; it gives rise to a train of symptoms for the relief of which hysterectomy has many times been performed, unnecessarily and without benefit. (A. I. Folsom.²)

Retention of Urine in the Female.—The commonest cause of retention of urine in the female is stricture. W. B. Tatum³ finds other fairly common causes are urethral caruncle, cystocele, and prolapse of the uterus. M. R. Snodgrass⁴ describes a case of acute retention in a girl of 14 due to hæmatocolpometra. Such cases are not very unusual, and are due to angulation of the urethra by the distended uterus.

Urinary Incontinence in the Female.—A. M. Douglass⁵ has had success in three cases of complete lack of urethral sphincteric control by utilizing a portion of the levatores ani to construct a new compressor urethræ.

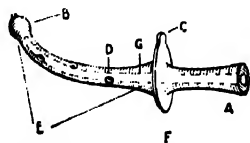


Fig. 94.—Cannula for irrigating the female urethra in gonorrhœa. See text. (Re-drawn from the 'Münchener medizinische Wochenschrift'.)

Sack and Amersbach⁶ describe a new cannula for the treatment of gonorrhœa in the female urethra. As the illustration (Fig. 94) shows, the cannula is bent to correspond with the curve of the female urethra. The swelling G shuts off the urethra in front, and so prevents the fluid from running out. The disc F stops all possibility of the cannula slipping into the bladder. The knob C serves as pointer for the correct orientation of the cannula. The spigot A serves for the attachment of a syringe or the rubber tubing of

an irrigator. The authors claim that after instruction the patient can safely insert the cannula herself and carry out the irrigation of the urethra without help. The apparatus can be obtained from Messrs. Krauth, Gänsemarkt, Hamburg.

Urethral Stricture.—There have been few communications on the treatment of urethral stricture this year. In America the pendulum seems to be swinging from radical surgery to more conservative methods of treatment. (J. R. Caulk.⁷)

Fatal Oil-Emboli in Treatment of Urethral Stricture.—Liquid paraffin is sometimes injected down the urethra in cases of difficult stricture. E. A. Patterson⁸ records two sudden deaths from oil emboli. Both patients became cyanotic and developed left hemiplegia before their exitus. This calls to mind a danger of aero-urethroscopy in the presence of urethral hæmorrhage, and should also serve as a warning of a possible complication when lipiodol injections are undertaken.

Urethrography.—After cleaning the meatus 10 to 15 c.c. of lipiodol are slowly injected into the urethra with a sterile syringe through a soft rubber teat. Other solutions which are used by some are 13 per cent sodium iodide or 15 per cent abrodil admixed with a small quantity of a bland disinfectant. Urethrography is a very valuable means of gauging the exact situation and extent of a urethral stricture. (R. Ledoux-Lebard et al., G. Parker.⁹)

Congenital Obstruction of the Posterior Urethra.—In recent issues of the MEDICAL ANNUAL considerable attention has been directed to congenital valves and strictures, as the causative agent of urethral obstruction in early life. A. I. Dodson¹¹ states that obstructive lesions of the urethra constitute by far the largest percentage of congenital defects in the urinary tract. These patients give a history of enuresis, dysuria, or incontinence. Only too often the real cause of the trouble is overlooked, and it is not unusual for the back-pressure consequent upon the obstruction to lead to a fatal issue. The diagnosis is difficult and can only be made by cysto-urethroscopy—often an extremely difficult matter in an infant. Dodson describes three cases which were recognized and cured by destroying the valve with a high-frequency current. Congenital valves of the urethra usually occur in males, but O. Addison¹² reports a fatal case in a little girl of 4 years. (See also UROLOGICAL SURGERY IN CHILDHOOD.)

Carcinoma of the Urethra.—T. J. Kirwin¹⁴ has reviewed the literature of primary carcinoma of the urethra and finds reported 99 instances in the male and 96 in the female. Carcinoma of the urethra appears to be a growth of low malignancy. W. E. Lower¹⁵ has treated and followed up 3 male patients with histologically proved urethral carcinoma. In 2 a local excision with end-to-end anastomosis was performed. In the remaining case the penis, testes, and inguinal glands were excised, the proximal urethra being brought out in the perineum. All the patients were alive and well three to nine years later, which goes to show that *early cases can be cured by even a local excision of that part of the urethra containing the growth.* The difficulty is to make an early diagnosis. The symptoms are similar to stricture. The tumour occurs mainly in the membranous portion of the urethra, and fistulæ are an early and regular accompaniment.

Infections of the Urethra, etc., in the Etiology of Ischiorectal Abscess.—C. J. Drucek¹⁶ studied 400 cases of ischiorectal abscess occurring in the great New York hospitals. The proportion of females was very small—6.5 per cent. The average age in the men was 34, and no case occurred below the age of 18; 68.4 per cent of the males gave a previous history of gonorrhœa, and in very few was any rectal disease found. The author therefore deduces that the majority of these infections of the ischiorectal fossa are from the posterior urethra or the prostate.

REFERENCES.—¹*Amer. Jour. Surg.* 1931, Aug., 251; ²*Jour. Amer. Med. Assoc.* 1931, Nov. 7, 1345; ³*Med. Times*, 1931, xiii, 251; ⁴*Jour. Amer. Med. Assoc.* 1931, Sept. 12,

777; ⁵*Amer. Jour. Obst. and Gynecol.* 1931, xxii, 739; ⁶*Munch. med. Woch.* 1931, Oct. 9, 1753; ⁷*Jour. of Urol.* 1931, xxvi, 407; ⁸*Jour. Amer. Med. Assoc.* 1931, Oct. 17, 1147; ⁹*Paris Méd.* 1932, Feb. 6, 106; ¹⁰*Brit. Jour. Urol.* 1932, 1; ¹¹*Virginia Med. Monthly*, 1931, May, 102; ¹²*Arch. Dis. Childh.* 1932, 25; ¹³*Jour. Amer. Med. Assoc.* 1931, April 15; ¹⁴*Jour. of Urol.* 1932, May, 539; ¹⁵*Trans. Amer. Assoc. G.-U. Surgeons*, 1931, xxiv, 249; ¹⁶*Med. Jour. and Record*, 1931, Oct. 7, 317.

UROLOGICAL SURGERY IN CHILDHOOD.

John Fraser, Ch.M., F.R.C.S.Ed.

It is interesting and significant that the literature dealing with affections of the urinary tract in infancy and childhood is rapidly increasing. Pathological conditions hitherto unsuspected have been described, and their influences in the production of various clinical entities are being appreciated, advances in instrumentation having rendered possible the procedure of cystoscopy in cases in which it had hitherto been considered impossible, while intravenous urography affords a means of investigation in difficult or otherwise selective cases.

Obstructive Errors.—The increasing width of the field is indicated in a recent paper by H. L. Kretschmer.¹ He very rightly makes allusion to the fact that anomalies, mainly of an obstructive character and many of them congenital in origin, are the underlying factors which explain the persistence of many cases of chronic pyelitis in infants and young children. Of these congenital obstructive errors three are of particular importance, because their existence is so apt to be overlooked. These are bladder-neck obstruction, hypertrophy of the verumontanum, and valves of the posterior urethra. In each of these the history has points of similarity: persistent straining on micturition, the development of a distended bladder, the appearance of a bladder infection which ultimately leads to a septic involvement of one or both kidneys. In the early stages of the condition bladder symptoms are predominant, but with extension of the error signs of a more general character are evidenced, and it may constitute a complicating factor in the differential diagnosis that these are apt to be of a gastro-intestinal nature—abdominal pain, vomiting, and diarrhoea. It is important to appreciate that in any case of persistent pyuria in infancy and childhood which fails to yield to ordinary therapeutic measures steps should be taken to exclude the possibility of an underlying obstructive lesion being in existence.

The congenital nature of the obstructive lesions under discussion is beyond dispute, but there is evidence that in two of them (obstruction of the bladder neck and urethral valve obstruction) an error of the autonomic nervous system somewhat on a parallel to that believed to exist in congenital pyloric stenosis and Hirschsprung's disease is the original etiological factor.

TREATMENT.—In regard to treatment, contraction of the bladder neck demands **Dilatation** by bougies until all tendency to contraction is overcome; urethral valve contraction may be overcome by dilatation, but a more reliable method is to remove the valvular element by **Diathermy**, **Cutting**, or by a modified **Punch Operation**. When hypertrophy of the verumontanum exists it is usually necessary to open the bladder and to excise the enlarged organ through the internal meatus.

(See also URETHRA, SURGERY OF—CONGENITAL OBSTRUCTION.)

Malignant Kidney Tumours.—These form an important group in the urological surgery of childhood. They are discussed by F. Lieberthal² in an article which describes the findings in seven cases. He draws attention to the fact that hæmaturia is rarely, if ever, a feature of the disease, the reason being that the tumour element is always sharply encapsulated, so that vascular elements are cut off from access to the renal calices and pelvis. The author states that an early symptom not hitherto described is persistent cough, the

development of which he ascribes to irritation of the terminal branches of the vagus nerve.

The tumours are also discussed in a paper by A. L. Dean, jun., and G. T. Pack.³ These authors go fully into the symptomatology and the differential diagnosis of the disease, but the real interest of this paper is in relation to the question of treatment. They make the interesting statement that tumours of this kind should never be submitted to primary operation, since they will certainly recur if such a procedure be adopted. On the other hand, they should be treated by external radiation, by **X rays** or by **Radium Pack**, until such time as the tumour has shrunk to a negligible size. When this stage is reached **Nephrectomy** is carried out. If the opportunity of removing the tumour during its period of inactivity is neglected, recurrence is inevitable, and successive recurrences are increasingly resistant to radiation. Treatment by implantation of gold-encapsuled **Radon Seeds** has been attempted, but the results have not been encouraging.

The radio-sensitivity of these tumours has been recognized, but, so far as the reviewer is aware, this is the first record of their treatment by radio-therapeutics. Sixteen cases form the basis of the summary.

Congenital Hydronephrosis.—This is a well-recognized clinical entity. Kuster once reviewed 500 cases, and pointed out that, though apparently congenital in incidence, the condition is really a development secondary to obstruction at a subrenal level, ureteral when unilateral, bladder-neck or urethral when bilateral.

J. A. Lazarus⁴ now describes an interesting complication of the disease—that of traumatic rupture. He states that the condition has probably escaped notice in the past, and adds that the degree of force necessary to produce rupture may be remarkably slight; in one instance the damage arose from leaning across the edge of a chair. Two cases illustrative of the complication are recorded, one in a child of 6 years, the other in a boy of 15. The first case is of peculiar interest, because a cystic kidney of the left side ruptured, and four months later a similar complication arose on the right side. The symptoms associated with the complication are sudden pain in the loin, a certain measure of collapse, abdominal distension, and, if the true state of affairs is unrecognized, the development of a phlegmon in the loin.

The origin of congenital hydronephrosis forms the basis of a paper by K. Hutter.⁵ The various clinical aspects are fully discussed, and special attention is paid to the theory that an error in the neuromuscular balance of the autonomic nervous system may play some part in the development of the disorder.

Renal Anomalies.—The rarer forms of renal anomalies—renal agenesis, congenital solitary kidney, unilateral congenital renal hypoplasia (fœtal or lobulated kidney), and crossed renal dystopia, with or without fusion—are discussed by E. R. Mintz and J. D. Stewart.⁶ The points brought out are that these errors are not as rare as might be anticipated, that the left kidney is more commonly affected than the right, that solitary kidneys are peculiarly liable to disease affections, and that even in the absence of demonstrable disease such disturbances as pain, hæmaturia, and palpable tumour may arise, because renal anomalies are liable to be affected by deficient drainage and faulty vascularization.

Intravenous Urography.—The scope and value of intravenous urography is debated by T. H. Lanman.⁷ It has been hoped that intravenous urography would be of especial value in children and infants by eliminating the difficulties and dangers attending cystography and retrograde pyelography. The paper is significant in so far as it is fair and frank in its criticism of the procedure.

The technique is similar to that followed in adults; the exact dosage is not stated, but it is evident that a three-quarters adult dose is well tolerated by infants under a year old. Experience has shown that the best pictorial results are obtained when exposures are made forty-five to sixty minutes after injection. The author's final conclusions are that, while the medium is a valuable adjunct in the diagnosis of urinary tract disease in children, the method has certain definite risks and limitations. The risks arise in the presence of renal inefficiency and obstruction to the urine outflow, while the points of limitation may be summarized in the statement that cases associated with considerable urinary tract infection and concomitant renal damage are unlikely to yield satisfactory visualization of the urinary tract by the use of intravenous urographic media. Inasmuch as the great majority of cases in infants and children demanding urological investigation are cases of pyuria or of urinary obstruction, it is evident that the method has both risks and limitations. The author expresses the view that the investigation is one which should be used only after a careful estimation of the renal efficiency, and that at no time should it be employed indiscriminately. (See also PYELOGRAPHY.)

REFERENCES.—¹*Surg. Gynecol. and Obst.* 1931, liii, 129; ²*Ibid.* 77; ³*Jour. Amer. Med. Assoc.* 1932, Jan. 2, 10; ⁴*Ann. of Surg.* 1932, Jan., 117; ⁵*Wien. klin. Woch.* 1931, Dec. 4, 1529; ⁶*New Eng. Jour. Med.* 1931, Dec. 31, 1282; ⁷*Ibid.* Nov. 26, 1036.

UTERUS. (See also HYSTERECTOMY; PELVIC INFLAMMATION.)

UTERUS, CANCER OF. (See also CANCER, RADIUM TREATMENT OF.)

Beckwith Whitehouse, M.S., F.C.O.G.

Cancer of the Cervix Uteri in Nulliparous Women.—The nulliparous cervix is commonly regarded as being relatively immune from the incidence of carcinoma owing to the absence of the lacerations and chronic infections which only too often are the sequelæ of labour. In the present campaign against cancer of the cervix uteri it is recommended that all women having had children be examined at regular frequent intervals and that all irritative precancerous lesions of the cervix be repaired or healed by appropriate means. That the nulliparous cervix which is the seat of a chronic inflammatory lesion or papillary erosion is also a potential source of danger is proved by the experience of L. E. Phaneuf.¹ During a period of five months, from November, 1930, to April, 1931, this author saw three cases of cervical carcinoma in nulliparous women. The ages of the patients were 25 years, 34 years, and 28 years respectively. One was single, one married, and the third a widow. In the first case the growth proved to be a papillary adenocarcinoma which presumably had developed at the site of a simple papillary erosion. It was treated by means of Radium and deep X-ray Therapy and the growth was arrested. The second patient presented an extensive epithelioma involving both cervical lips, but apparently limited to the uterus. It was similarly treated by means of radium and deep X rays, but the growth rapidly extended to the pelvic cellular tissue, and in a few months the uterus was entirely fixed and the patient in the terminal stages of the disease. The third case, an example of squamous-celled carcinoma of typical 'cauliflower' type limited to the cervix in a woman aged 28, responded to radium and roentgen therapy, and at the end of seven months the growth appeared to be entirely arrested. The previous clinical history in all three patients failed to show any symptoms which might suggest a precancerous condition; and although the author emphasizes the importance, and value of extending routine local examination to the nulliparous cervix, it seems difficult in the absence of symptoms to justify the need for this.

Cases such as these emphasize the importance of very careful investigation and treatment of all catarrhal cervical lesions in the nullipara, and of course constitute a further argument for the routine adoption of *total* hysterectomy, even in nulliparæ, should it be necessary to extirpate the uterus. (*See HYSTERECTOMY, TOTAL AND SUBTOTAL.*)

REFERENCE.—*New Eng. Jour. Med.* 1932, April 21, 840.

VACCINATION. (*See also SMALL-POX.*) J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—M. Perilman¹ points at that whereas during the Franco-Prussian war of 1870–1 there were 125,000 cases of small-pox with 23,470 deaths among the 600,000 soldiers of the French army, during the war of 1914–8 owing to the strict enforcement of vaccination there were only 8 cases with 1 death among the 8,000,000 mobilized. France thus reaped the benefits of a law passed in 1902 whereby vaccination was made compulsory during the first year of life and revaccination in the eleventh and twenty-first years. The law also enacted that in case of war, public disasters, or a threatening epidemic vaccination or revaccination should be made compulsory for all persons, whatever their ages might be, who could not show evidence of vaccination or revaccination within the last five years. The strict enforcement of the law has yielded the following results: (1) From 150,000 to 200,000 persons, or a large percentage of the population of Paris, have been vaccinated since 1914. In the Seine department the annual number of vaccinations ranges from 70,000 to 75,000. (2) The great majority of infants are vaccinated. (3) The relatively high percentage of successful vaccinations in persons between 1 and 10 years of age and below 21 shows that persons of this age should be vaccinated. (4) Owing to the fact that in the 1926–7 small-pox epidemic in Paris a larger number of women than men were attacked, care should be taken that more women of the age of 21 should be vaccinated.

TECHNIQUE.—After discussion of the various modes of vaccination introduced since Jenner's time, J. Posbeyekian² is in favour of the method of short multiple incisions which has been almost universally adopted with the most satisfactory results. Dressings are not only unnecessary but are even harmful, as they are likely to give rise to septic complications and even tetanus. No special method of vaccination has yet been found to protect against the occurrence of post-vaccinal encephalitis.

SYMPTOMS AND COMPLICATIONS.—According to E. Schleyer,³ localization of secondary *vaccinia on the genitals* of recently vaccinated persons is much rarer than in other aberrant sites, such as the eye, tongue, or trunk, and the transmission of *vaccinia* to the genitals of persons who have not been recently vaccinated is rarer still. Schleyer reports the case of a woman, age 31, who presented considerable œdema of the labia and five vesicles on the upper part of the labia majora and anterior commissure. There was bilateral inguinal adenitis, and the temperature was 99.6°. Her last vaccination was twenty-one years previously, but her child had been vaccinated successfully a week previously, and she had been bathing in the same water which she had used for applying the dressings to the child's arm. The inflammation subsided under treatment by compresses and dusting powder. *Vaccinia* of the vulva differs from pemphigus by the absence of lesions elsewhere, from herpes progenitalis by the larger size of the vesicles and the presence of adenitis, and from hard chancre by the absence of infiltration.

J. J. London⁴ describes a *very serious sequel of vaccination*, of which he could find only five examples (including one of his own) in the literature of the last twenty years, all reported by French observers. The patients were all between the ages of 50 and 65, who had been vaccinated or revaccinated while under

treatment in hospital for leukæmia or subleukæmia. The symptoms consisted in a violent inflammatory reaction at the site of vaccination, considerable enlargement of the lymphatic glands in the axilla and elsewhere, deterioration of the general condition, rise of temperature, progressive emaciation, very pronounced anæmia, and enormous leucocytosis. Four of the five cases proved fatal between two and five weeks after vaccination.

M. J. van Stockum⁶ found that Javanese children who were vaccinated during the first three months of life had no disturbance of growth after the operation and only exceptionally had any complications such as fever, diarrhoea, bronchitis, otitis media, eczema, pyoderma, conjunctivitis, or adenitis. When such complications did occur, they were mild and did not affect the general condition. Disturbance of growth, however, and greater frequency of the complications mentioned became noticeable with increase in age, so that vaccination in the second half of the first year of life seemed as undesirable in Java as in Europe. Van Stockum, however, recommends that vaccination should not be carried out before the sixth week of life, as before the child has reached that age it is impossible to determine whether it possesses a stable equilibrium.

H. S. Cumming⁶ illustrates the increase in the number of cases of *post-vaccinal encephalitis* notified annually in the United States by the following figures: 1921, 0; 1922 and 1923, 1 case each; 1924, 2; 1925, 3; 1926 and 1927, 1 case each; 1928, 10; 1929, 12; and 1930, 18. 21 of the 49 cases were in males and 28 in females. The ages ranged from 3 to 49 years. The interval between vaccination and the onset of the nervous symptoms ranged from five to thirty-three days, but in 66 per cent the symptoms appeared in from ten to thirteen days after vaccination.

N. M. J. Jitta⁷ reports that out of 866,100 vaccinations performed in Holland between 1924 and May, 1931, 186 were followed by encephalitis, which is equivalent to 1 case of encephalitis for every 4656 vaccinations. Among about 62,000 children who were vaccinated in the first year of life there were only 3 cases of encephalitis, and among 137,000 children between 1 and 2 years only 5 cases, or 1 case to every 25,000 vaccinations in children under 2 years of age. All these children recovered without sequelæ. Among 660,000 children between 2 and 11 years there were 159 cases, or 1 in 3570; 55 of these died, or a proportion of 1 death to 15,749 vaccinations. In 1930 5 cases occurred among 27,131 vaccinations, or 1 case among 5426 vaccinated persons.

C. Kling⁸ states that among 10 cases of post-vaccinal nervous complications notified in Sweden between January 1, and October, 1931, only 7 appeared to be genuine cases. The patients were aged from 2½ to 7 years, the only fatality being in a child aged 6 years. The cases were distributed throughout six of the twenty-four provinces of Sweden, 2 being in the same district. There was no direct relation between the intensity of the vaccinal reaction and the development of encephalitis. The symptoms in all the cases and the pathological appearances in the fatal case were the same as in those reported elsewhere.

Cases of *myelitis* following vaccination have recently been recorded by T. W. Brockbank,⁹ H. Gounelle,¹⁰ and D. Paulian, C. Ariccesco and M. Finkelstein.¹¹ Brockbank's case was in a boy, age 6 years, in whom the symptoms appeared on the thirteenth day after vaccination. Complete spinal anæsthesia and paralysis developed up to the level of the ninth dorsal segment and were still present six weeks after the onset. Gounelle's patient was a man of 21 who developed lumbosacral myelitis a fortnight after revaccination. Complete recovery took place in six weeks' time. The case reported by Paulian and

others was that of a girl, who two days after revaccination at the age of 7 years became feverish, and twelve days later had pain in the calves. Walking became increasingly difficult, and the upper extremities became involved. Some improvement took place, but the issue of the case is not recorded.

REFERENCES.—¹*Thèse de Paris*, 1932, No. 87; ²*Ibid.* 227; ³*Zentralb. f. Gynäkol.* 1932, 838; ⁴*Thèse de Paris*, 1932, No. 80; ⁵*Kinderarztl. Praxis.* 1932, 8; ⁶*Bull. Off. internat. d'Hyg. publ.* 1931, 1801; ⁷*Ibid.* 1804; ⁸*Ibid.* 1932, 81; ⁹*Jour. Amer. Méd. Assoc.* 1931, xcvii, 227; ¹⁰*Paris méd.* 1931, ii, 144; ¹¹*Bull. Soc. méd. Hôp. de Paris*, 1932, 237.

VARICELLA. (See CHICKEN-POX; HERPES ZOSTER.)

VARICOCELE. (See TESTIS, ETC., SURGERY OF.)

VARICOSE VEINS, INJECTION TREATMENT OF.

Sir W. I. de C. Wheeler. F.R.C.S.I.

There is a plethora of contributions to recent medical literature on the treatment of varicose veins by injection. The reviewer has found the technique simple and the results satisfactory. **Quinine and Urethane** is the solution of choice. Many surgeons recommend 20 per cent **Sodium Chloride** solution, and others 20–40 per cent **Sodium Salicylate** solution, or 50 per cent **Dextrose**. There are some who use one solution in one type of case and other solutions for other types. Quinine and urethane as supplied in ampoules by recognized commercial firms will be found satisfactory in about 90 per cent of the cases; $\frac{1}{2}$ to 2 c.c. is the average dose. The patient's tolerance to quinine should be ascertained by giving the smaller dose at the first injection.

K. M. Lewis¹ points out that the pain associated with the injection of quinine and urethane is negligible and that the percentage of positive thrombosis is as high as when other solutions are employed. He believes that quinine and urethane is the solution of choice for the injection treatment. The needle used for injection must be sharp. The legs hang in the dependent position and the injections are made as a rule from below upwards. Injections are given once a week. Following the injection, a small sterile compress is applied over the site of injection and firm pressure is made for two or three minutes. Lewis recommends that no tourniquets and no bandages be applied. He does not place the patient in the recumbent position during the injection in an attempt to empty the vein and bring the sclerosing solution in more intimate contact with the vein wall. "We tried this for a while and could see no improvement in our end-results." The most important point in the technique is to take care that none of the solution is injected outside the vein. If this happens a slough may result. All sloughs are characterized by the relatively great length of time it takes for separation and healing to take place. Some take four or five months to heal. Lewis mentions several cases where an ulcer had been present for over twenty years, and after injection of the veins complete healing occurred within six weeks. No local treatment was applied to the ulcer.

H. Biegeleisen² deals with the prevention of slough in the injection treatment of varicose veins. He shows how a vein may be punctured in several places during the search for its lumen, and the solution may escape through these holes to cause a slough. Referring to *Fig. 95, A* shows that the vein has been punctured in several places. In *B* the needle point lies in a hematoma. In *C* some of the sclerosing fluid is on the outside of the needle and is carried into the tissues. In *D* a long-bevel needle is partly inside and partly outside the vein, and in *E* a thin-walled vein has been torn by the needle. It can thus be

seen how a perivascular injection can be made in the face of apparently good technique. This writer concludes: (1) Sloughs depend less upon solutions than upon technique; (2) The addition of methylene blue to the injecting

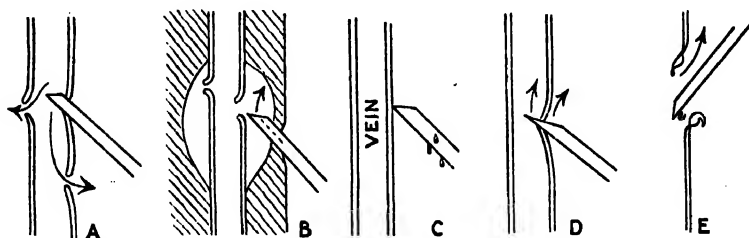


Fig. 95.—Showing how the solution may escape into the tissues in injection treatment of varicose veins. See text. (Re-drawn from the 'American Journal of Surgery'.)

solution is recommended; by this means perivascular injection can be early detected.

D. R. Jensen³ concludes as follows: (1) A knowledge of the pathology is the basis for the confidence in the injection treatment of varicose veins, and the high percentage of cures indicates its efficacy. (2) No one solution satisfies all the requirements for the injection treatment, consequently several solutions must be at one's command in order to secure satisfactory results. (3) Patients with any active disease should not be treated until the condition has entirely abated and several months have elapsed. (4) Patients of all ages can be treated. (5) Care and meticulous attention to detail will practically eliminate complications. (6) The majority of ulcers heal rapidly following the obliteration of the varicose veins and the re-establishment of adequate nutrition to the tissues. (7) If but one solution is available, the most satisfactory is 5 per cent urea hydrochloride and quinine.

Many authorities, including I. S. Tunick and Robert Nack⁴ and R. H. Maingot,⁵ recommend **Sodium Morrhuate** as a sclerosing agent in the treatment of varicose veins. Maingot states, however, that in spite of its advantages, in his experience the solution has been disappointing as regards end-results: 30 per cent of cases showed some degree of recanalization; urticaria developed in 5 per cent of the cases.

Maingot's paper is most instructive. With regard to technique he advises: (1) An ordinary hypodermic needle and syringe. (2) If quinine urethane is used, not more than $\frac{1}{2}$ c.c. should be injected at the first sitting; subsequently, 1 to 2 c.c. may be used, either at one or more points in the vein—the total amount not to exceed 3 c.c. If sodium morrhuate is used, five to ten injections of $\frac{1}{2}$ to 1 c.c. may be given. (3) When the injection is to be given on the anterior aspect of the thigh or leg, the patient may be seated with the foot on a low stool. If the veins are situated posteriorly, the patient may either stand or lie supine. If the veins are very large, the patient should lie prone on a couch so that the veins may be as collapsed as possible. (4) A tourniquet is only necessary where the veins cannot be rendered prominent. A pneumatic tourniquet, from which air pressure can be speedily released, is recommended.

More than one injection may be necessary at a sitting. Maingot refers to what he calls the 'twin injection'. Certain large tortuous veins are very difficult to sclerose. In such cases 3 c.c. of **Quinine-Urethane** and 4 c.c. of **Lithium Salicylate** are injected from two separate syringes simultaneously at a distance of two to four inches in the same vein. The two solutions are incompatible

and when mixed together produce a white, glutinous precipitate which adheres to the vein wall. The 'twin injection' cannot be given single-handed.

A. Dickson Wright⁴ draws attention to the difficulty experienced in inducing large veins to react to the various sclerosing solutions. He states that it is fairly certain that a considerable number of these large veins will recanalize, even when they have been coaxed into thrombosing. He feels that the solution of both problems lies in a combination of ligation and injection. The treatment remains ambulatory. An incision half an inch long is made across the most prominent of a group of veins, and when the subcutaneous tissue is reached, a small retractor (Fig. 96) is inserted. The vein is then picked up

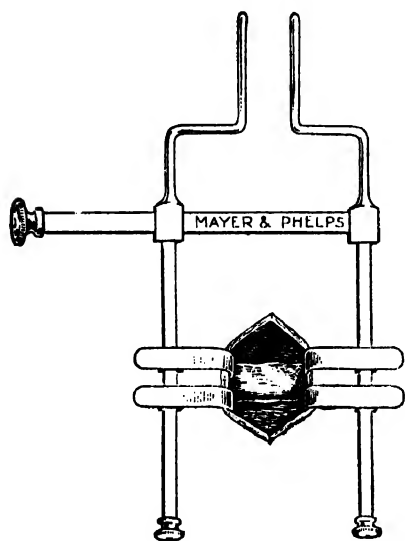


Fig. 96.

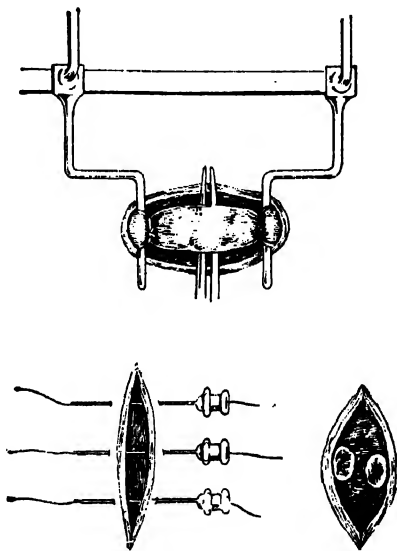


Fig. 97.

Figs. 96, 97.—Technique of injection treatment of varicose veins. See text.

(Figs. 96 and 97 by kind permission of the 'British Medical Journal'.)

and freed from connective tissue, the retractor removed and turned round, and the prongs inserted under the vein and separated (Fig. 97). The vein is thus stretched and elevated. While so held, 2 c.c. of 5 per cent sodium morrhuate are injected into the lumen of the vein, to fix the thrombus which will form after the ligation. Two ligatures of catgut are now passed round the vein, at least an inch apart, and the vein is divided between them. The wound can be closed with fine silkworm gut, passed through hypodermic needles (Fig. 97); by using these one is able to reduce the number of instruments required.

REFERENCES.—¹*Ann. of Surg.* 1932, May, 727; ²*Amer. Jour. Surg.* 1932, June, 441; ³*Ann. of Surg.* 1932, May, 738; ⁴*Ibid.* 734; ⁵*Practitioner*, 1932, July, 174; ⁶*Brit. Med. Jour.* 1932, i, 934.

VARIOLA. (See SMALL-POX.)

VIRILISM. (See ADRENAL GLANDS; OVARIAN HORMONES; PITUITARY BODY.)

VITAMINS.*G. E. Oates, M.D., M.R.C.P., D.P.H.*

Important advances have been made during the last few years in our knowledge of the vitamins. The whole subject is exhaustively reviewed in Special Report No. 167 on Vitamins¹ compiled by a committee appointed jointly by the Lister Institute and the Medical Research Council. S. J. Cowell² also furnishes a short review of the most recent work. It is impossible to do more here than to abstract some matters of general interest.

Vitamin A.—This fat-soluble factor is necessary to ensure the satisfactory health and growth of small laboratory animals. Vitamin A deficiency in human beings is associated with xerophthalmia and night-blindness. It appears to diminish susceptibility to infection and to protect the central nervous system from toxic influences. Puppies fed on vitamin A during the first few months of their lives do not get pyorrhœa in their adult lives. Pregnant women fed with vitamin A are stated to suffer less from puerperal infection. Vitamin A is closely related chemically to the pure substance carotene, which is converted into it in the body. Pure carotene is now adopted as a standard of vitamin A activity. The primary sources of vitamin A are the pigmented parts of plants—containing chlorophyll or other pigments. Foodstuffs rich in vitamin A are cod-liver oil, ox, pig, and sheep liver, egg yolk, cheese, ripe tomato, spinach, green peas and fresh green vegetables. Milk and butter, while being relatively poor in vitamin A, are nevertheless extremely valuable sources, owing to the prominent position which they occupy in the normal human diet. Vitamin A is destroyed by oxidation, but is somewhat resistant to heat. The amount present in any food can be estimated fairly accurately by a colour reaction with antimony trichloride.

Vitamin D.—This fat-soluble substance has the specific function of controlling the deposition of calcium and phosphorus in tissues. The bone defects occurring in man due to vitamin D deficiency are rickets, osteoporosis, and osteomalacia. The teeth of experimental animals are influenced by vitamin D and excess of cereals. In children the liberal supply of vitamin D and the restriction of cereals has been found to have a well-marked preventive action against the spread of dental caries. Vitamin D has been isolated in crystalline form and named calciferol. It is obtained from irradiated ergosterol by a comparatively simple chemical process and has an extremely high antirachitic potency. Vitamin D can be generated in the skin by the action of sunlight on the ergosterol in it. Foodstuffs rich in vitamin D are cod-liver oil, egg yolk, butter from pasture-fed cows, and oysters. Beef fat, pig liver, milk, and cream are less reliable sources. Vitamin D is more resistant to heat and oxidation than vitamin A.

Vitamin B.—This is a complex, and two factors B₁ and B₂ have been specially studied.

Vitamin B₁.—This is called the antineuritic vitamin. It protects animals from experimental polyneuritis and human beings from beri-beri. It has probably an important relation to metabolism, glandular secretion, and gastrointestinal movements. It has been prepared in a relatively pure state in a highly active concentrate, but its chemical constitution is not known. Foodstuffs rich in vitamin B are maize and wheat embryo, rice embryo and polishings, lentils, dried peas, hazelnuts, carrots, lettuces, cabbages, orange pulp, beef, mutton, liver, heart, ox brain, sheep brain, egg yolk, yeast, and malt extract. Vitamin B₁ resists a temperature of 100° C. well, but tinned foods which have been subjected to a much higher temperature are virtually free from it.

Vitamin B₂.—This is called the antidermatitis vitamin or the P-P (pellagra-preventive) factor. It is able to cure skin lesions occurring in rats fed on a diet devoid of it. The causation of pellagra is not understood, but deficiency in

vitamin B₂ appears to be an important factor. Vitamin B₂ has chemical properties which are not well-defined and its composition is unknown. It usually accompanies vitamin B₁ in ordinary foodstuffs, but hen's egg white contains vitamin B₂ and no B₁. Vitamin B₂ accompanies the proteins of 'high biological value'. The richest known sources are liver, yeast, milk, and green-leaf vegetables. Egg yolk, egg white, and ox muscle are good sources. Vitamin B₂ is resistant to heat and survives the ordinary processes of cooking and canning with little or no impairment.

Vitamin C.—This water-soluble substance is preventive of scurvy in human beings and certain animals. It is sensitive to heat, more so if there is oxidation at the same time. It stands drying badly and is more unstable in alkaline than in neutral media.

Among green-leaf vegetables the cabbage and watercress are two of the richest sources of vitamin C. Lettuce, asparagus, cauliflower, and spinach are also rich in it. Among root vegetables raw swede juice is in the front rank. Potato is usually rich in this vitamin. The juice of orange, lemon, and grapefruit is rich in it; the juice of the grape contains none. Tomatoes and mangoes are rich sources. Fresh lime-juice is an unreliable source, and preserved lime-juice is virtually useless. Apples vary greatly, the most potent variety being Bramley's Seedling. Vitamin C, although absent from dry resting seeds, such as peas and beans, is formed during germination. It is very necessary to bear in mind the effect of cooking on foodstuffs containing vitamin C. All forms of slow cooking and the use of alkalis are to be avoided. A convenient way of feeding vitamin C to institution children during the winter months is described by the School Medical Officer of the L.C.C. (1931 Report). Raw cabbage, beetroot, carrots, turnips, and other garden produce are passed through a mincing machine and served raw mixed with sauce. Such a salad is generally acceptable to children of all ages.

The Vitamins of Cow's Milk.—The vitamin A content is greater when the cow is receiving fresh green food than when the diet is one of cereals and roots. An adequate vitamin D content is only ensured by a diet of fresh green food together with exposure to the sun. The vitamin B and C contents vary greatly according to the diet of the cow. Cow's milk is variable in vitamin content and supplementary vitamin supplies are necessary when it is used for infant feeding. The vitamin D content can be enhanced by ultra-violet irradiation of the milk. The effect of the careful pasteurization or the momentary scalding of cow's milk on its vitamins is very slight, but vitamin C is appreciably affected. Higher degrees of heat cause rapid destruction of vitamin C.

The evidence as to vitamin content of dried milk is inconclusive. It depends on the conditions of manufacture, storage, etc. In any case it must, even more than raw milk, be supplemented from other sources. The antirachitic power of dried milk is increased by ultra-violet irradiation.

Unsweetened condensed milk is markedly deficient in vitamin C. Sweetened condensed milk is not so deficient.

The Vitamins of Human Milk.—Vitamin A is normally present and there is no record of xerophthalmia in a breast-fed infant. Experimentally human milk is a poor source of vitamin B complex. Since scurvy is rare in breast-fed infants, vitamin C is normally present. Clinical rickets is not uncommon in breast-fed children, and early occult rickets has been proved to be extremely common in such children in certain American towns. Such samples of human milk as have been tested for the presence of vitamin D have shown marked deficiency. There is little experimental evidence to show that vitamins given to a nursing mother are secreted in the milk, but on theoretical grounds this is very likely, particularly as regards vitamin D.

In the Special Report referred to it is stated that all nursing mothers and infants should receive abundant supplies of vitamins. As regards infants, this object can be best attained according to present knowledge in the following ways :—

1. By breast feeding of the infant for eight or nine months.
2. By supplying the following foods to infants when partially or entirely artificially fed :—
 - a. Cow's milk to form the bulk of the diet up to eight or nine months and the basis of the diet for a year afterwards. At no time in the first year after weaning ought an infant to receive less than 1 to 2 pints daily, and after this not less than a pint.
 - b. Cod-liver oil, to supply vitamins A and D (and iodine)—in the following quantities : infants of three months, a teaspoonful daily, infants of five months and older, two teaspoonfuls daily.
 - c. Egg yolk, to supply vitamins D, A, and B— $\frac{1}{2}$ to 1 egg daily.
 - d. Orange juice or tomato juice for vitamin C—two or more teaspoonfuls daily.
 - e. Marmite for vitamin B complex—a small quantity daily.
 - f. Purées of vegetables, e.g., spinach, carrot, and turnip ; cabbage or potato may also be added from about six months of age.

REFERENCES.—¹*H. M. Stationery Office*, 1932 ; ²*Bull. of Hyg.*, 1932, March, 139.

VON RECKLINGHAUSEN'S DISEASE (Generalized Osteitis Fibrosa.) (See PARATHYROID GLANDS.)

VON RECKLINGHAUSEN'S DISEASE (Multiple Neurofibromatosis). *Macdonald Critchley, M.D., F.R.C.P.*

Recent clinical and pathological studies have abundantly shown that the disorder known as generalized neurofibromatosis is a much more complex condition than was originally believed and described by von Recklinghausen. A very considerable literature has now grown up around this most interesting disease, and it is perhaps not inopportune to set out the present conceptions of its nature and symptomatology.

Heredo-familial Character.—It is now a well-established fact that von Recklinghausen's disease in the great majority of cases shows familial and heredo-familial properties. In a family described by Leclerc it was transmitted through five generations. Cases associated with a completely negative family history we now regard as exceptional. This familial tendency escaped recognition for a considerable time, chiefly because the clinical manifestations are not usually homologous. In other words, it is perhaps rather uncommon for two or more complete cases of von Recklinghausen's disease to be present in one generation or even in a single family ; on the other hand, it is common, if not the rule, to find amongst the relatives of such a case several examples of *incomplete* forms of von Recklinghausen's disease. If the true nature of these *formes frustes* is unrecognized, then the heredo-familial characteristics will escape recognition.

To-day, then, we look for, and usually find, instances of pigmentary and other abortive types amongst the relatives of a patient suffering from von Recklinghausen's disease.

Symptomatology : Complete Form.—The clinician to-day realizes that numerous structures outside the nervous system are affected in the typical and complete case of von Recklinghausen's disease ; and for the purpose of description we may group the clinical manifestations under five heads, namely : (1) Neurological ; (2) Cutaneous ; (3) Skeletal ; (4) Endocrine ; and

(5) *Psychical*. When signs belonging to all five groups coexist, one speaks of the case as one of *complete* von Recklinghausen's disease.

1. *Neurological Findings*.—The neurological findings are the best known. Typically they consist of neurofibromatous tumour masses growing at any point upon the nervous system. They may affect the larger nerve-trunks or even the finer terminal fibrils of the cutaneous nerves (peripheral neurofibromatosis). The main trunks of any peripheral nerve may be affected, whether motor, sensory, or mixed in nature. The tumours are hard and painless, and although they may attain a considerable size, they only very rarely interfere with the functional activity of the nerve. Occasionally the peripheral nerve-trunks are affected by a diffuse irregular thickening rather than by a localized nodular swelling. When the finer peripheral twigs of the nerves are affected the tumours may be extremely numerous; over 4000 have been counted on one patient. The larger examples are often pedunculated. If the terminal filaments are affected, the condition arises which is known to dermatologists as 'molluscum fibrosum'. At other times one particular nerve may be the seat of a neoplastic overgrowth, affecting not only its trunk but every one of its finest ramifications. Associated with this a hypertrophy of the skin and subcutaneous tissues may be found, giving rise to a plexiform neuroma. In the more extreme instances—where, for example, an entire limb is affected—there develops a so-called pachydermatocoele or the elephantiasis nervosa of Virchow.

The autonomic nerve-fibres may also be implicated in von Recklinghausen's disease, so that neurofibromata may arise in the walls of the viscera or in relationship with the peritoneum.

The other common localizations in the nervous system for neurofibromatous growths are the spinal roots and the cranial nerves (central neurofibromatosis). In this way pressure may arise on important structures such as the spinal cord and the brain-stem. Although any cranial nerve may be affected, the auditory nerves are by far the most vulnerable. Symptoms of intracranial tumour may develop, although the slow rate of growth often delays the onset of general hypertension symptoms for a considerable time. Small neurofibromata may also grow in association with the nerve elements of the retina, giving rise to the ophthalmoscopic appearance of flat, greyish-white masses in the fundus. Van der Hoeve has described these by the name of 'phakomata'.

Very rarely indeed generalized peripheral and central neurofibromatosis occurs in association with other neoplastic states of the nervous system. Not a few cases are on record of combinations of neurofibromata with multiple gliomata, or with endotheliomata, or with states of intramedullary gliosis of the spinal cord.

Usually the ordinary neurofibromatous tumours cause no symptoms, unless—as in the case of the central tumours—they happen to compress important structures. A complication may develop, however, in the form of a malignant change within the tumour mass so that the neoplasm takes on a rapid increase in size, with infiltration and formation of metastases.

2. *Cutaneous Manifestations*.—Von Recklinghausen's disease is of dermatological interest by reason of the diversity of its cutaneous manifestations. These may actually antedate the appearance of the subcutaneous tumours, and in some cases they may occupy the foreground of the clinical picture.

Pigmentary changes may be considered first. A uniform bronzing of the whole integument may be present, while in other instances patches of vitiligo are seen. As a rule the pigmentation spares the face and ends at the upper thorax—not by an abrupt line of demarcation, but by an irregular zone of

freckling. The face alone may be affected by this bronzing (chloasma); usually the mucous membranes escape. Sometimes the skin immediately overlying a neurofibroma is deeply tinted.

Much more typical of von Recklinghausen's disease are the pigmented patches occurring mostly over the trunk. These are oval or circular areas, varying in diameter from 0.5 to 5 cm. and with sharply defined edges—the well-known café-au-lait areas (*Plate LX*).

Combinations of pigmentary with hyperplastic processes may give rise to small raised patches, circular in outline, distributed usually over the trunk.

Nævoid formations of various types are important skin manifestations in this disease. These range from the small 'spider nævi' to the larger 'port-wine stains'. Pigmentary deposits may also be seen (black nævi), and hairs may rarely be present. Sometimes there is also a hypertrophy of the affected area of skin and subcutaneous connective tissue.

The so-called 'blue spots' are often seen, especially in cases of neurofibromatosis in which the tumours are particularly numerous. They are of a peculiar translucent appearance and give the impression of a dark-blue patch viewed through a flimsy, semi-opaque medium. They are obviously raised above the level of the skin, but on palpation the finger actually sinks into a slight dimple. These 'blue spots' are, in reality, early neurofibromatous tumours growing in the deeper layers of the skin; at a later stage they project as small button-like appendages and lose their blue tint.

3. *Skeletal Changes*.—Changes in the bones and articulations are now known to constitute a very important feature of the symptomatology. Interest in the osseous changes in von Recklinghausen's disease was stimulated first by E. Pearce Gould.¹ Later the work of E. Stahnke,² B. Brooks, and E. P. Lehmann,³ followed by that of F. Parkes Weber and J. R. Perdray,⁴ emphasized this particular aspect.

From the point of frequency, some degree of spinal curvature is probably the most important change. Lateral or antero-posterior bending may occur and is usually only slight in degree. Occasionally, however, the angulation is so extreme as to interfere with the functions of the spinal cord and so produce a postural type of paraplegia.

Exostoses constitute one variety of bony change; the commonest site for these outgrowths is from the cranial bones. The converse condition—namely, some defect—may also occur, especially in the skull. In particular, thinning of the bone is met with in areas immediately underlying plexiform neuromata.

Osteoporosis and osteomalacia constitute a most important skeletal anomaly in this disease. Sometimes deformities of the most advanced type are encountered, although such cases are not common. The bony softening may be localized or universal in distribution.

One very characteristic bony change is seen in the appearance of the so-called subperiosteal cysts. These are revealed radiographically as oval or rounded areas situated superficially upon a bone in the neighbourhood of a joint (*Plate LXI*). Brooks and Lehmann have suggested that these are actually neurofibromata growing upon the subperiosteal nerve filaments.

Proliferative changes in the joints are sometimes seen in association with von Recklinghausen's disease. Lastly, one may include those developmental anomalies affecting the skeleton such as cheiromegaly and spina bifida.

Spontaneous fractures only rarely occur in the disease, but a case in point has recently been studied and described by L. P. Ashton.⁵

4. *Endocrine Changes*.—Although by no means a frequent concomitant, the results of endocrine disorder are often recognizable in patients with von Recklinghausen's disease. No one organ is necessarily implicated, though the

PLATE LX

VON RECKLINGHAUSEN'S DISEASE



Fig. A. Cutaneous lesions in von Recklinghausen's disease, showing a large number of café-au-lait patches.

PLATE LXI.

VON RECKLINGHAUSEN'S DISEASE · *continued*

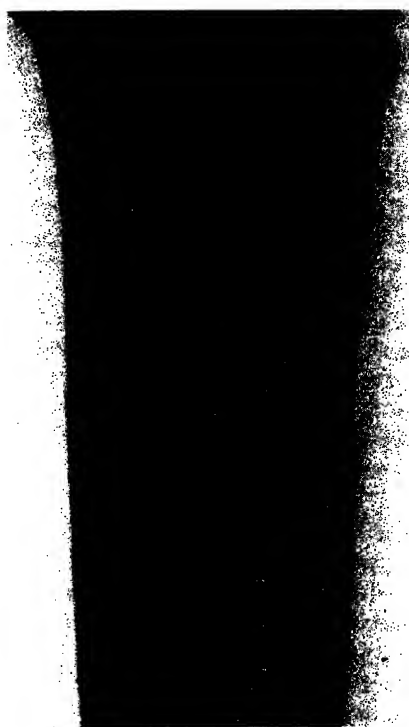


Fig. B.—Skiagram of tibia and fibula from a case of von Recklinghausen's disease, illustrating a subperiosteal cyst at the head of the fibula.

pituitary body shows most often evidence of disordered activity. Thus, the coexistence of acromegaly with multiple neurofibromatosis is well known, and examples have been recorded by G. Wolfsohn and E. Marcuse,⁶ De Castro,⁷ H. W. Barber and A. W. Ormond,⁸ W. Lier⁹ and Jeanselme, and many others. Less typical states of hyperpituitarism may be present, and striking examples of this association have been recorded by B. Tucker.¹⁰ It is much rarer to find a condition of hypopituitarism accompanying von Recklinghausen's disease, though H. W. Barber and M. E. Shaw¹¹ have reported one such case. An excellent example is portrayed in *Fig. 98*. Some authors would regard the characteristic pigmentary appearances as indicative of adrenal dysfunction, but more striking instances of Addisonian-like syndromes with von Recklinghausen's disease are known (Bosquet, Bourey and Laignel-Lavatine, Jullien¹²). A suprarenal tumour was present in one case reported by Kawaskima. Thyroidal symptoms are rare, though the coexistence of Graves' disease has been observed. E. Mallam's case suggests an implication of the sex-glands.



Fig. 98.—Von Recklinghausen's disease with hypopituitarism

His patient, a boy of 8, showed marked skeletal overgrowth in addition to von Recklinghausen's disease. The sexual organs were over-developed and the secondary characters were of adult type. Whilst under observation, he developed a mumps orchitis; shortly afterwards the subcutaneous tumours disappeared, but the gigantism persisted.

5. *Psychical Changes.*—Many patients with von Recklinghausen's disease are of subnormal intelligence; a few are obviously imbecile. The majority of cases, however, are able to work and live their ordinary lives without provoking comment, though a psychologist would recognize a certain defect in the intelligence quotient. Psychotic traits are not usually present. Epilepsy is not rare, however, and may commence in adult life.

Incomplete Forms.—The characteristic physical signs of von Recklinghausen's disease develop slowly, and manifestations of one particular type, e.g., cutaneous, may antedate the onset of other signs by many years. These early and incompletely developed cases may be regarded as *formes frustes* of the disease. Dermatological changes constitute the commonest incomplete form of the disease, and we are well aware that years may elapse between the

appearance of abnormal pigmentation and the development of subcutaneous tumours. There is the case of a little girl demonstrated before the Dermatological Society in 1905 by F. Parkes Weber; at that time she showed numerous areas of bronzing over the body. Twenty-one years later the patient was again shown before the same society, having now developed a number of neurofibromata and a plexiform neuroma on the neck.

A patient whose case is recorded by E. Moniz showed a plexiform neuroma many years before developing the other characteristics of von Recklinghausen's disease.

Another neurological abnormality which is often present as an abortive variety is the bilateral occurrence of auditory nerve tumour. A recent discussion of this aspect of the case, with the record of personal cases, has been made by L. Minski.¹³

Whether it is correct to regard the common single neurofibromatous tumour of the spinal roots or of the VIIIth nerve as also constituting a *forme fruste* is uncertain. Some histologists, notably W. Penfield and A. Young,¹⁴ believe that these are distinct, and that they differ in certain microscopical details from the Recklinghausen type of tumour; on the other hand, there are other histologists who confess themselves unable to distinguish the two types of tumour under the microscope. That these solitary tumours are probably related to von Recklinghausen's disease is perhaps supported by a case under the notice of the reviewer, where two neurofibromata only were present in separate spinal roots, while at the same time there was an absence of any other clinical suggestion of von Recklinghausen's disease in the patient or in members of his family.

Reference has already been made to the appearance of incomplete forms among the relatives of a patient with multiple neurofibromatosis.

Nature of the Disease.—On clinical and histopathological grounds it is widely believed that von Recklinghausen's disease is by nature a congenital dysplasia. This view is supported by the not infrequent coexistence of other anomalies such as syringomyelia, spina bifida, and meningocele, in this way associating the disease with the so-called status dysraphicus.

Some pathologists have been seeking to link up Recklinghausen's disease with two other rare congenital dysplasias of the nervous system—namely, hypertrophic interstitial neuritis (see MEDICAL ANNUAL, 1932, p. 323) and TUBEROSE SCLEROSIS (q.v.). At the present time, however, the problem is still entirely speculative.

REFERENCES.—¹Quart. Jour. Med. 1918, xi, 221; ²Deut. Zeits. f. Chir. 1922, clxviii, 6; ³Surg. Gynecol. and Obst. 1924, xxxviii, 587; ⁴Quart. Jour. Med. 1930, xxiii, 151; ⁵Bristol Med.-Chir. Jour. 1930, Autumn; ⁶Berlin klin. Woch. 1912, xlix (i), 1088; ⁷Nouv. Icon. de la Salpêtr. 1912, 4; ⁸Proc. Roy. Soc. Med. (Dermatol. Sect.), 1922, Feb. 6; ⁹Wien. klin. Woch. 1913, xxvi, 1003; ¹⁰Arch. Neurol. and Psychiat. 1924, xi, 308; ¹¹Brit. Jour. Dermatol. and Syph. 1922, xxxiv, 207; ¹²Thèse de Paris, 1909-10, No. 266; ¹³Jour. Neurol. and Psychopathol. 1932, xii, 289; ¹⁴Arch. Neurol. and Psychiat. 1930, xxiii, 230.

WHOOPING-COUGH.

J. D. Rolleston, M.D., F.R.C.P.

BACTERIOLOGY.—P. Fonteyne¹ examined the heart blood and pulmonary juice in a number of fatal cases of whooping-cough, with the following results. In 8 cases the heart blood showed no *B. pertussis*, the culture being negative in 5 cases, while in the other 3 pneumococci, *B. coli*, and a saprophyte were found. In 4 out of 8 fatal cases culture of the lung during life showed *B. pertussis*, while in the other 4 only the ordinary pathogenic organisms—namely, *B. influenzae*, pneumococci, staphylococci, and streptococci—were found. Fonteyne concludes that: (1) The very severe and fatal cases of whooping-cough are never accompanied by *B. pertussis* septicæmia; (2) *B. pertussis*

can give rise by itself to fatal bronchopneumonia, especially in infants under one year of age; and (3) Puncture of the lung may be of value in the diagnosis of a specific bronchopneumonia due to *B. pertussis*, when the rapid course of the disease does not allow the paroxysmal stage to develop.

SYMPTOMS AND COMPLICATIONS.—From a study of 14 infants under 2 years of age, the subjects of tuberculosis, which was latent in 10 and in 4 was of the glandulo-pulmonary type, M. Dumans² comes to the conclusion that whooping-cough does not have an important influence on the extension of pre-existing tuberculous lesions. In the few cases in which such an extension occurs, the whooping-cough merely acts by interference with nutrition.

TREATMENT.—A. J. Turner³ records excellent results from treatment by **Ultra-violet Rays** in whooping-cough patients whose average age was 5 years, the youngest being a baby of 8 months. The whole body was exposed to the rays at a distance of 36 in., the patient lying first in the supine and then in the prone position. The exposure was made once a day until the principal symptoms had disappeared, and then twice a week for one or two weeks. The dosage varied from $\frac{1}{2}$ minute to 2 minutes both to the back and front according to the age of the child, and was increased daily by $\frac{1}{2}$ minute in young children and by 1 minute in older ones. Care should be taken not to produce pigmentation, as this interferes with the passage of the rays.

J. C. S. Battley⁴ refers to severe cases of whooping-cough successfully treated by various French observers by injection of the **Whole Blood of Convalescents**, and records two cases in infants aged 1 year and three weeks respectively treated by 12 c.c. of **Convalescent Serum** and by 20 c.c. of whole blood, with rapid improvement and recovery.

REFERENCES.—¹*Comptes rend. Soc. de Biol.* 1932, cx, 976; ²*Thèse de Paris*, 1932, No. 369; ³*Practitioner*, 1932, cxxviii, 66; ⁴*Arch. of Pediat.* 1931, 675.

WORMS, INTESTINAL.

Robert Hutchison, M.D., F.R.C.P.

A. E. Keller, H. Casparis; and W. S. Leathers¹ have tried to find out what symptoms and signs are produced by infestation with round worms by a clinical study of over 160 cases in children. Disturbances of sleep and some abdominal discomfort were the only symptoms that could be attributed to the worms. Nor were there any signs except a moderate eosinophilia (5 to 9 per cent), but there was no correlation between the degree of the eosinophilia and the intensity of the infestation. Examination of the stools is the only means of diagnosis.

Hexylresorcinol is recommended as an anthelmintic by Lamson² in round-worm and hook-worm infestation. It is best administered in hard gelatin capsules and no food should be taken before or for four or five hours after it. The dose is 1 grm. for children of 12 and upwards. A second treatment is rarely necessary and there are no ill effects except occasional slight gastric irritation.

Tetrachlorethylene has been found an effective anthelmintic in most forms of worms by C. Garin and others.³ It is administered in gramme capsules for three days in doses of 3, 4, and 5 grm. on each day respectively. The capsules are taken in the morning one by one at intervals of an hour. On the third day, about three hours after the last capsule, a saline purge is given. During the treatment the patient must be kept completely at rest, must avoid alcohol, and take plenty of milk. The urine should be tested daily three or four hours after the administration of the capsules, as albuminuria sometimes results. There are no other ill effects.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1931, Aug. 1, 302; ²*Ibid.* (abstr.), 347. ³*Brit. Med. Jour.* (abstr.), 1931, ii, 30.

YELLOW FEVER.*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

J. H. Bauer¹ has tested the degree of dilution of the blood of infected animals which will produce the disease when inoculated into rhesus monkeys. In a dilution of 1-1,000,000 all eighteen bloods proved to be infective, and three out of six were positive in dilutions of 100,000,000. The degree of susceptibility of the monkeys varied considerably with these high dilutions, and animals were sometimes immunized without evident outward signs of infection; in others the incubation period was long, but death followed a short febrile attack. Yellow fever antibodies developed early in the serum of the infected animals dying on the seventh day protected against large doses of the virus, but the serum of animals infected with minute doses of the virus did not develop protective properties. The virus survived in the organs of animals in a state of advanced post-mortem decomposition. J. H. Bauer² also reports on the duration of passive immunity in monkeys injected intraperitoneally with 2-c.c. doses of serum, which was found to be sufficient to protect them against 0.25 c.c. of virus injected subcutaneously three hours later. It was found that complete protection lasted for at least three weeks, and partial immunity, as shown by recovery from slight fever, for thirty-five days; but at the end of seven weeks all protection had been lost. Further tests showed that immune serum of homologous animals gave more lasting protection than that of a foreign species. This indicates that human immune serum from a patient convalescent from yellow fever is likely to be more protective in man than that of animals immunized against yellow fever.

A. W. Sellards³ reports on the precautions required in maintaining the virus of yellow fever in monkeys and mosquitoes, which he has succeeded in doing for three and a half years without any laboratory infections occurring except one mild one through infected mice. The virus can be preserved by freezing, with economy in time and monkeys. He also describes a glass tube for removing mosquitoes from a cage of infected ones without the danger of any escaping. J. A. Kerr and T. B. Hayne⁴ report experiments to test the conclusion of Aragao's that it is possible to infect male *A. aegypti* by placing them in contact with infected females. The infectivity of the mosquitoes was tested by injecting emulsions of them into susceptible monkeys after the normal bred males had been exposed to, and observed to copulate with, infected females immediately, three weeks, and nine weeks after the females had taken infected blood meals. No infection was shown in any of the 152 male mosquitoes used.

G. P. Berry and S. F. Kitchen⁵ record full notes of seven cases of yellow fever contracted in the laboratory during experimental work on the virus. They varied from very mild to moderately severe, and all recovered. In the mildest forms the only characteristic symptom met with was the paradoxical pulse-temperature relationship, and jaundice, albuminuria, and black vomit were absent or of very slight degree. Bradycardia may occur in the absence of jaundice. Electrocardiograms and X-ray measurements furnished additional evidence of myocardial injury. Guanidine increase in the blood of a mild case afforded evidence of extensive liver destruction. Convalescent serum in bi-monthly doses of 5 c.c. failed to prevent laboratory infection. Leucocyte curves in five cases showed a progressive leucopenia up to the fifth or sixth day. The monocyte count was unaltered during the acute stages and rose during convalescence. These changes were of diagnostic importance even in mild cases. The virus was demonstrated in the blood in one case as late as the fifth day, and antibodies were found in this case on the fourth day.

Recent advances in our knowledge of yellow fever have been well summarized by W. B. Johnson⁶ with special reference to the extensive researches in West Africa by the Rockefeller Foundation workers, who by means of the

protection test described in the 1932 MEDICAL ANNUAL have established the important fact that yellow fever is widely prevalent throughout West Africa far inland from the costal regions, and that it produces only a mild infection in the natives not easily recognized, but very severe attacks occasionally in Europeans. Thus in one Northern Nigeria group of villages no less than 88 per cent of the children examined showed evidence of protective serum in the blood, and in the other areas the rates were 45 to 60 per cent, indicating a previous attack of yellow fever; this points to a recent epidemic of the disease among the native population. That such an unrecognized epidemic may occur among the African population is of great importance in framing quarantine regulations, especially in connection with the air services, although the risk is diminished by their use almost exclusively by European passengers. The author advises the extension of the system of the segregation of Europeans in West Africa within European residential areas, to the neighbourhood of which sanitary aerodromes should be confined, and intensification of sanitary measures in the adjacent native towns.

REFERENCES.—¹*Amer. Jour. Trop. Med.* 1931, Sept., 337; ²*Ibid.* Nov., 451; ³*Ibid.* 1932, Jan., 79; ⁴*Ibid.* May, 255; ⁵*Ibid.* 1931, Nov., 366; ⁶*Brit. Med. Jour.* 1932, Aug. 13, 285.

II

THE PRACTITIONERS' INDEX.

NEW PHARMACEUTICAL AND DIETETIC PREPARATIONS,
MEDICAL AND SURGICAL APPLIANCES, ETC.

In this Section we give short descriptions of the Pharmaceutical Products and the New Inventions of the past Year. Every care is taken to notice only articles that seem worthy of our readers' attention. It should be understood that the information is supplied by the Makers. We invite all concerned with the Medical Manufacturing Industries to co-operate with us in making this section valuable for present and permanent reference.

A short typewritten description of each article is required, with the advantages claimed for it, and with the Maker's name and address appended. The Editors cannot accept reference to circulars or catalogues as a compliance with these conditions. Illustrations of instruments may be inserted if small.

In the section on Drugs, their composition, principal applications, and dosage should be stated in the fewest possible words.

All particulars for this Section should reach us by November 30.

PROGRESS OF PHARMACY, DIETETICS, ETC.

Adrephine Inhalant.—This is a combination of adrenalin and ephedrine with benzo-caine and chlorotone in a glycerin base. Used as a soothing and astringent application for congested conditions of the nasal and laryngeal mucous membrane. (Parke, Davis & Co., 50-54, Beak Street, London, W.1.)

Albarol is a new and highly efficient barium meal for X-ray visualization of the alimentary tract. It contains 55.2 per cent barium sulphate, is non-toxic, non-irritating, and is pleasant to take. It is administered orally, the contents (125 grm.) being mixed with water to form a paste which is taken just before the examination. (May & Baker Ltd., Battersea, London, S.W.11.)

Alka-Dextro.—A finely-granular mixture of dextrose and effervescent ingredients with a slight excess of citric acid, which produces, after effervescing, 20 per cent of sodium citrate. Alka-Dextro provides constituents which rapidly promote physiological alkalinity in conditions of acidosis and similar disturbed conditions of the acid-alkaline balance in the blood. (Parke, Davis & Co., 50-54, Beak Street, London, W.1.)

A-Menotab.—A tablet containing one of the corpus luteum hormones, anterior pituitary, and ovarian hormone, with a very small dose of thyroid, used in the treatment of secondary amenorrhœa and dysmenorrhœa. The dose for secondary amenorrhœa is 2 3 tablets t.d.s. a.c.; for dysmenorrhœa, 6 tablets t.d.s. a.c. for 3 or 4 days preceding and the first day of the menstrual period. (Paines & Byrne Ltd., 31, Northampton Street, London, W.1.)

Antipneumococcus Serum (Felton) Type I.—A refined and concentrated solution of pneumococcus antibodies prepared according to Felton's method, but from Type I organisms only. Supplied in bulbs containing either 10,000 or 20,000 units. (Parke, Davis & Co., 50-54, Beak Street, London, W.1.)

Antuitrin 'S.'—A solution of the anterior-pituitary-like sex-stimulating hormone which possesses both follicle-stimulating and luteinizing properties, the latter action being the more pronounced. In small doses Antuitrin 'S' is indicated in delayed sex development and functional amenorrhœa; in larger doses for the treatment of menorrhagia, climacteric hæmorrhage, and threatened abortion. (Parke, Davis & Co., 50-54, Beak Street, London, W.1.)

Atebrin.—This is the latest synthetic drug for the treatment of malaria. It belongs to the acridine series. Atebrin given by itself acts both on the schizonts and gametocytes of tertian and quartan malaria. In these two forms of malaria the temperature returns to normal on an average after two or three days. The parasites of both forms disappear from the peripheral blood on an average within three or four days.

In subtertian malaria atebrin given alone destroys the ring forms only, these disappearing on an average within four or five days. In order to destroy the gametocytes it is therefore necessary to combine atebrin with plasmoquine simplex, which acts on the sexual forms of malaria parasites. With this combination therapy the plasmodia are generally no longer demonstrable in the blood after four to five days.

The usual dosage of atebrin for adults is 0.3 grm. daily for five days in tertian and quartan malaria, and 0.3 grm. + 0.03 grm. plasmoquine simplex in subtertian malaria; this latter combination may also be used for all types of malaria. For children the dosage is proportionately less. Atebrin is issued in tablets of 0.1 grm., in bottles of 15 and 300 tablets. (Bayer Products Ltd., 19, St. Dunstan's Hill, London, E.C.3.)

'Azoule' Calcium L.B.—A sterile, 40 per cent solution of calcium lactobionate (a combination of calcium with an oxidation product of lactose), for paronteral administration of calcium in tuberculosis, oedema (e.g., of Bright's disease), tetany, and other conditions of calcium deficiency. Dosage: adults, 5 c.c. daily, on alternate days, or every third day; children, 1 to 2.5 c.c. at the same intervals. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

'Azoule' Liver Extract Solution.—A highly purified preparation for intramuscular and intravenous injection in pernicious anæmia. Indicated where the patient is critically ill or cannot take enough liver extract by mouth (5 c.c. — 100 grm. of fresh liver). Tested physiologically and found suitable for intravenous use in doses up to 12 c.c. Average doses: intravenous, 5 c.c.; intramuscular, 2 c.c.—daily for three or four doses; later, usually, once a week. (Allen & Hanburys Ltd., London, E.2.)

Calcio-Coramine.—This new "Ciba" speciality is the double salt of pyridine- β -carbonic acid diethylamide and calcium sulphocyanate. It possesses a reinforced expectorant action for internal administration in the treatment of bronchitis, catarrh, bronchopneumonia, emphysema, pulmonary oedema, pulmonary abscess, etc. Moreover it is a potent cardiac and respiratory stimulant in cases of physical fatigue and threatening collapse. It is available in the form of 0.40 grm. (6 gr.) tablets in tubes containing 20. (The Clayton Aniline Co. Ltd., 40, Southwark Street, London, S.E.1.)

Calcium Sodium Lactate Tablets, 'Allenburys'.—An extensive research in the Pharmacological Laboratories of the Pharmaceutical Society has shown that calcium sodium lactate is the ideal salt for the oral administration of calcium. These tablets are palatable and each contains $7\frac{1}{2}$ gr. of the salt. Their use is indicated in pregnancy, lactation, gynaecological disorders, chilblains, certain cases of urticaria, tuberculosis, rickets, and in preparation for tonsillectomy. Dosage: one to three or more daily. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Carboserin is a specially activated form of vegetable charcoal, issued in tablet form; each tablet weighs 6 gr. It will absorb nearly forty times as much methylene blue as ordinary charcoal and is indicated in all types of dyspepsia, especially when accompanied by flatulence, and as an antidote for vegetable poisoning. Further, it will prevent headache following the administration of general anaesthetics (ether, chloroform, ethyl chloride, etc.). The dose is one tablet dissolved in water, three or four times daily, and it is issued in tins of 50 tablets. (Bayer Products Ltd., 19, St. Dunstan's Hill, London, E.C.3.)

Coramine 5.5 c.c. Ampoules.—This new package has been introduced to meet a specific demand for coramine in larger doses for the treatment of cases of poisoning and for the effective counteraction of avertin narcosis. In *The Lancet* for May 28, 1932, p. 1143, there is an article by Kennedy from Dr. James Young's Gynaecological Clinic, Royal Infirmary, Edinburgh, and the Physiology Department, Edinburgh University, in which the work of Killian (*Klin. Woch.* 1931, x, 1446) is referred to and confirmed, and cases of avertin narcosis in which large doses of coramine were successfully employed are referred to. In the *Medizinische Klinik*, 1932, No. 4, Chron published an article on "The life-saving action of large doses of coramine in cases of poisoning from phanodorm, luminal, morphine, and veronal, etc." Very severe cases of poisoning are described. These were completely free of symptoms in a remarkably short time after 10–15 c.c. of coramine had been given intravenously.

Ampoules containing 5.5 c.c. of the drug are available in boxes of 3 and 12. (The Clayton Aniline Co. Ltd., 40, Southwark Street, London, S.E.1.)

Crescormone.—The isolated growth hormone of the anterior pituitary. The dose is one injection daily. (Paines & Byrne Ltd., 31, Southampton Street, London, W.1.)

Diabetic Breakfast Food, 'Allenburys.'—Crisp, palatable, and granular. Has won widespread appreciation among patients on low carbohydrate diets. Approximate content of calorific materials: protein, 54 per cent (15.3 grm. per oz.), carbohydrate, 27 per cent (7.65 grm. per oz.), fat, 9 per cent (2.55 grm. per oz.). Calorific value: 110 calories per oz. (two level tablespoonfuls). (Allen & Hanburys Ltd., London, E.2.)

Diabetic Rusks, 'Allenburys.'—The product of prolonged investigation in order to obtain attractive taste and colour. Sugar-free, crisp, with a distinctive flavour, they provide a welcome change for patients on restricted carbohydrate diets. Approximate content of calorific materials: protein, 56 per cent (6.35 grm. per rusk), carbohydrate, 22.5 per cent (2.55 grm. per rusk), fat, 5.5 per cent (0.74 grm. per rusk). Average calorific value per rusk, 42 calories (105 calories per oz.). (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Diagnothorine is a 25 per cent aqueous suspension of thorium oxide specially designed for X-ray visualization of the mucous membranes of the oesophagus, stomach, and duodenum. It is of high density, slightly astringent in action, non-toxic, and not unpleasant to take. For almost all necessary examinations 25 c.c. of the product is sufficient. (May & Baker Ltd., Batterssea, London, S.W.11.)

Diginutin, which was introduced by Messrs. Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.1., as a stable solution of the total glucosides of digitalis leaf, is now also available as 'Tabloid' Diginutin, a compressed product of uniform potency embodying the advantage of convenience of administration, especially for ambulatory patients. The strength of diginutin is adjusted to correspond with that of standard B.P. tincture. Diginutin may be prescribed to greater advantage whenever tincture of digitalis is indicated, as, unlike the tincture, it undergoes no diminution of activity. The 'Tabloid' product is issued in two strengths equivalent to 5 min. and 10 min. of diginutin respectively, in bottles of 25 and 100.

Digitalin Granules, 'A. & H.'—These contain digitaline cristallisé of the French Pharmacopoeia. Their use is recommended in cases where galenical preparations of digitalis have failed. They are prepared in two strengths: gr. $\frac{1}{10}$ ($\frac{1}{10}$ mgrm.) and gr. $\frac{1}{20}$ ($\frac{1}{20}$ mgrm.). Dosage: gr. $\frac{1}{10}$ daily for ten days, gr. $\frac{1}{20}$ for four days, or gr. $\frac{1}{20}$ daily for 2 to 3 days. Further details of dosage may be had in a leaflet. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Elixir Ephedrine Compound.—A combination of ephedrine, caffeine, sodium iodide, and belladonna, designed to give relief in whooping-cough, asthma, and other conditions associated with bronchial and laryngeal spasm. (Parke, Davis & Co., 50-54, Beak Street, London, W.1.)

Elixir Glandophosph. Conc. (R. & B.).—A mixed gland tonic elixir containing suprarenal W.G., thyroid, pituitary W.G., ovarian W.G., ox gall, pepsin, testes, with the glycerophosphates of manganese, potassium, and sodium. The dose is 1 drachm three times daily before food. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

Elixir L. Y. H.—A palatable preparation two fluid drachms of which contain the extract from one ounce of fresh liver, the equivalent of ten grains of dried yeast, and an adequate amount of hæmoglobin prepared by a special process which conserves its natural properties. Elixir L.Y.H. is designed for use chiefly in debility with a tendency to anaemia. Dosage: adults, a dessertspoonful thrice daily with water; children, according to age. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Entodon is an iodine preparation for administration by subcutaneous, intramuscular, or intravenous injection. Chemically it is a 20 per cent solution of hexamethyl-diamino-isopropanol-biniodine, issued in ampoules of 2 c.c. each.

Entodon has given excellent results in the type of case usually amenable to potassium iodide, but where for any reason the latter drug is not well tolerated. The usual dosage is one ampoule of 2 c.c. daily or every second or third day. Some observers have given as much as two ampoules per day over a prolonged period without any signs of iodism. (Bayer Products Ltd., 19, St. Dunstan's Hill, London, E.C.3.)

Erugon is a testicle hormone, standardized by the "comb growth unit" (Pezard's comb growth method), issued in ampoules of 1 c.c., each ampoule containing 2 C.G.U.

Published reports show that erugon has given good results in various forms of impotence, especially where due to neurasthenia. In addition to the improvement of sexual function, a favourable influence on the general condition and disposition has been observed. In eunuchoidism great reduction in weight and increased functional capacity occurred, while in adipose patients sexual inadequacy was in many cases relieved. It is further recommended for psychic depression accompanied by loss of appetite, exhaustion, sleeplessness, and addiction to alcohol, as well as in the treatment of prostatic affections and the after-treatment of prostatectomy. Intra-muscular injections are well tolerated. (Bayer Products Ltd., 19, St. Dunstan's Hill, E.C.3.)

Eschatin.—An extract of the suprarenal cortex specially prepared for intravenous or subcutaneous injection in the treatment of Addison's disease. Eschatin is manufactured exclusively by Parke, Davis & Co., with the direct co-operation of Drs. Swingle and Paffner, the originators. The product is standardized biologically on bilaterally suprarenalectomized dogs. (Parke, Davis & Co., 50-54, Beak Street, London, W.1.)

French Syrup.—A valuable cough mixture. Each fluid ounce contains codeine phosphate, $\frac{1}{2}$ gr., and tincture of aconite, 4 min., with calcium creoso-lactophosphate and flavouring syrup. Expectorant, antiseptic, deodorant, sedative, antipyretic, and tonic. Applicable to most cases of cough, including phthisis, pneumonia, fetid bronchitis, etc. Dosage: one to two teaspoonfuls or more every four hours. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Gaster Siccata B.D.H.—It is now established that the administration of stomach tissue produces a rapid remission in pernicious anæmia; hence the need has arisen for a reliable desiccated stomach preparation suitable for human administration. The issue of Gaster Siccata B.D.H. supplies this need. The preparation is entirely British, and it bears the B.D.H. guarantee of purity and therapeutic activity; it is practically fat free, which property, together with the low moisture content of the product, ensures stability and precludes the possibility of the formation of decomposition products unpleasant in odour and taste. Gaster Siccata B.D.H., being prepared from fresh unsalted maws, has the further advantage of possessing a low mineral content.

The dose is from 10 to 30 grm. per day, according to the severity of the case. It contains no toxic constituents whatever; there is, therefore, no risk of harm resulting from overdosage. Put up in aluminium tubes, each containing 10 grm.: boxes of 3 tubes, 4s. 6d.; 6 tubes, 9s. 6d. (The British Drug Houses Ltd., Graham Street, London, N.1.)

Glandulax (R. & B.) Keratin Coated Tablets.—These contain intestinal substance, pituitary (p.l.), ox gall, ferments, agar-agar, and emodin, q.s. Their use is indicated in constipation, habitual and chronic, and intestinal atony. The dose is from 2 to 4, taken at night. (Reynolds & Branson Ltd., 13, Briggate, Leeds.)

The 'Glucator'.—This is an apparatus for the rapid and accurate quantitative estimation of urinary sugar by a simple colorimetric method, the quantity of sugar being subsequently calculated by reference to a table supplied with the apparatus. It is available, complete with reagent, at 10s. 6d. postage paid in the United Kingdom. (H. R. Napp Ltd., 3 & 4, Clements Inn, London, W.C.2.)

Gonadotrophin.—The isolated and standardized hormones from the anterior pituitary, which have a stimulating effect upon the gonads. The dose is 1 injection daily. (Panes & Byrne Ltd., 31, Southampton Street, London, W.1.)

Halibut Liver Oil, 'Allenburys'.—In vials and capsules ('Kapsol' Brand). An exceptionally palatable, golden-coloured product, prepared by a special process. Its 'blue value', indicating its vitamin A content, is standardized to sixty times that of good cod-liver oil. Indications for its use are malnutrition, pregnancy, lactation, and prophylaxis and treatment of certain infections. Daily dosage: prophylactic—babies, from 1 min.; adults up to 12 min.; children, intermediate amounts; in treatment—twice the above doses, or as necessary. (Allen & Hanburys Ltd., London, E.2.)

Haliverol.—Halibut-liver oil with viosterol. Haliverol is sixty times as potent as a good grade of cod-liver oil in vitamin A, and the vitamin D potency is increased by the addition of irradiated ergosterol to make it equivalent to 250 times that of a standardized cod-liver oil. (Parke, Davis & Co., 50-54, Beak Street, London, W.1.)

Herbaras Seeds.—The treatment of constipation is of such importance that we bring to the notice of our readers a natural remedy recently introduced into this country.

The principle of this new method is the formation of a jelly or mucilaginous mass by the addition of water to small Herbaras plant seeds. This jelly substance sweeps along the intestinal tube, collects the waste matter in its passage, wrapping it round and round in the manner of a cocoon, and, thus expelling it gently, leaves the bowel cleansed and healthy. Its action is to re-train the evacuating impulses to regularity, which it accomplishes, without any of the distress and pernicious effects associated with preparations of a purgative character. At the same time the Herbaras seeds possess the advantage of being a valuable aid to the digestive processes. They re-establish and preserve a healthy bowel tone, and can be recommended with every confidence of achieving their purpose. (John W. Longman, 489a, Oxford Street, London, W.1.)

Iodized Moogrol.—Iodized Moogrol for the treatment of leprosy is now issued by Messrs. Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.1. It is a mixture of esters of the acids of the chaulmoogric series combined with 0.5 per cent of iodine. The addition of the iodine markedly reduces the irritating properties of the ethyl esters. Preliminary clinical experience confirms that iodized moogrol is less irritating than plain moogrol.

At the Leonard Wood Memorial Conference on Leprosy, held at Manila in January, 1931, the use of iodized esters, particularly by the intradermal method, was strongly recommended. The intradermal or intracutaneous method has been employed by the Philippine workers for some years and the advantages claimed are that it produces a more rapid resolution of the superficial lesions and that it is relatively free from general and local reactions. Issued in bottles of 25 c.c., 100 c.c., and 1 litre.

Juglane, a product based on wild walnut (*Juglans*), is indicated in all forms of diabetes, whatever the age of the patient, gravity of the affection, or complications present. More especially indicated in florid, arthritic, or hepatic diabetes, in which it acts very rapidly.

Under the influence of this medication, the general condition of the patient notably improves, and after thirst ceases, the urinary volume rapidly diminishes and then the twenty-four hours' quantity of the urinary sugar declines. After the second or third week of treatment strength returns, and analysis shows only a small quantity of urinary glucose. During the ensuing weeks, continuance of the medication usually produces total disappearance of the sugar.

Juglane is absolutely harmless, and well tolerated even by the most delicate stomach. While being antidiabetic, it is at the same time depurative and tonic. It combats the cutaneous affections so frequently accompanying glycosuria, and stimulates and regulates the gastric and hepatic functions. Far from weakening the organism, it fortifies it and enables it to defend itself against the secondary infections (pneumonia, tuberculosis) which menace the enfeebled diabetic patient.

Juglane has no action upon the heart or intestine and is compatible with any form of medication. It does not require strict diet. Besides these qualities, it is one of the rare medicinal agents capable of effectively combating acetoneuria, such a disturbing complication of diabetes. In cases of acetoneuric diabetes, it is to be noted that Juglane overcomes acetone first, correcting sugar as a second step in its action.

Dosage: Four pills before each of the three daily meals, or 12 pills daily, taken with a little water. Except in cases of recent diabetes, which require only two or three packages, the average treatment requires six packages. (Guyot-Quenin & Son, 67, Southwark Bridge Road, London, S.E.1.)

Kaltron.—This polyvalent mixed vaccine for the prevention of colds, influenza, and catarrh consists of a suspension of dead organisms in physiological saline. Each c.c. of the vaccine contains:—

B. Influenzae (Pfeiffer) ..	400 millions
Streptococci	80 "
Pneumococci	200 "
Phenol preservative ..	0.5 per cent.

Dose recommended for general prophylactic purposes during infections and for the inoculation of contacts 0.5 c.c., with a second and third dose of 1 c.c. at intervals of seven days. Half the above doses should be given to invalids and children.

This vaccine is prepared for the Saccharin Corporation Ltd., 72, Oxford Street, London, W.1, under a special process by the Bayer-Meister-Lucius branch of the I. G. Farbenindustrie Aktiengesellschaft, at Leverkusen, Germany. Supplied in boxes of three ampoules of 1 c.c. each for occasional use, and in bottles of 10 c.c. and 25 c.c. Price: Box of 3 × 1-c.c. ampoules, 7s. 6d.; bottles 10 c.c., 10s.; bottles 25 c.c., 25s.

'Kapsol' Iron with Copper.—Capsules, each containing Bland's pill, 2 grm., with copper sulphate, 1.5 mgrm. The addition of copper in small amounts has been found to accelerate the hæmatopoietic action of iron, and this particular formula has been found successful in cases of idiopathic (hypochromic) anemia where iron alone had failed (*Canad. Med. Assoc. Jour.*, 1930, Feb., p. 175; *MEDICAL ANNUAL*, 1931, p. 29; *Amer. Jour. Med. Sci.*, 1931, Oct., p. 554). **Dosage:** three capsules daily with a little cascara as necessary. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Lactose-Dextrin, 'Allenburys'.—A pleasantly flavoured product containing 75 per cent of lactose and 25 per cent of dextrin, a combination which has been found to support, in the colon, a vigorous growth of anti-putrefactive bacteria, and thus to combat auto-intoxication. Its use is therefore indicated in such manifestations of intestinal auto-intoxication as lassitude, headaches, dermatoses, neuritis, rheumatoid arthritis, etc. **Dosage** (three or four times daily): 2 or 3 heaped tablespoonfuls, reduced after five or six days to 1 heaped tablespoonful, which is continued for several weeks. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Laxative Rusks, 'Allenburys'.—A crisp, very palatable, nutritious product containing liquid paraffin (one teaspoonful to each rusk), particularly suitable for patients who object to oily medicaments. The rusks are malted and therefore easily digested, and the fine sub-division of the paraffin ensures its even distribution in the intestines. Dosage (daily or twice daily): children, $\frac{1}{2}$ to 2; adults, 1 to 4. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Liver Extract B.D.H.—The advantage of Liver Extract B.D.H. over raw liver is in the simplicity of its administration and in its palatability. The contents of each tube merely requires to be mixed with a cup of hot water, in the same way as any ordinary meat extract. After mixing, condiments may be added to suit each individual palate. Boxes of 3 tubes, 9s.; 6 tubes 18s. (The British Drug Houses Ltd., Graham Street, London, N.1.)

Liver Extract (B. W. & Co.).—Messrs. Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.1, have issued Concentrated Liquid Liver Extract (B.W. & Co.) which may supplement, or replace, the whole of the amount of fresh liver in a daily diet. It is a palatable product and can be taken over long periods. Concentrated liquid liver extract is issued in bottles of 4 and 16 fl. oz., 1 fl. oz. containing the equivalent of 8 oz. of liver.

Livogen is a palatable liquid preparation containing the therapeutic principles, including vitamins B₁ and B₂, of fresh liver, together with measured amounts of hæmoglobin and additional vitamin B. It will be readily recognized, therefore, that livogen fulfils a long-felt need for a revitalizing tonic of a scientific nature and of certain therapeutic activity for use in that wide field of conditions commonly designated 'debilitated', whether such debility be associated with some form of secondary anaemia or whether it be the aftermath of influenza, pneumonia, or other illness.

Livogen resembles the more palatable meat extracts in flavour, and it can be taken direct from a wine-glass either neat or diluted with water. For the majority of cases the average daily dose should total one fluid ounce.

Livogen contains no inorganic iron; hence its administration is not followed by those intestinal troubles which are often caused by preparations containing iron in inorganic combination. For those cases of anaemia in which inorganic iron is indicated a preparation containing it may be prescribed for use collaterally with livogen. Issued in bottles of 4 fluid ounces. (The British Drug Houses Ltd., Graham Street, N.1.)

Lysolats (Perfumed).—These have been introduced to satisfy those people who have an inherent aversion to the usual odour of disinfectants generally and also to make the well-known lysolats more pleasant and palatable as a mouth wash and for gargling. The perfume is pleasant, and only a faint suspicion is noticeable to cover the odour of cresylic acid, but the potency and germicidal strength of lysolats is unimpaired.

Perfumed lysolats may be used for any of the purposes of ordinary lysolats, and in some cases, as for gargling and as a mouth wash, are preferable. (Solidol Chemical Ltd., Ashmead House, Disney Street, London, S.E.1.)

Neo-Cardyl.—Bismuth butylthiolaurate, an oil-soluble bismuth containing sulphur, the sulphur in the molecule facilitating the progressive and complete absorption of neo-cardyl. It possesses a high therapeutic action in the treatment of syphilis, is well tolerated, and the fact that it is oil-soluble allows more precise dosage of the quantity of bismuth injected. Dosage: 1½ c.c. injected at an interval of five to seven days. A course consists of 12 injections. (May & Baker Ltd., Battersea, London, S.W.11.)

Neo-Hydriol, a specially prepared ester of poppyseed oil, is a highly efficient opaque medium for use in bronchography, myelography, pyelography, etc. This product contains 40 per cent iodine, is absolutely non-irritant, and owing to its low viscosity, is able to penetrate the fine channels of the body. Dosage: 15 to 20 c.c. (May & Baker Ltd., Battersea, London, S.W.11.)

Neo-Iodipin.—An improvement on iodipin, consisting of iodine combined with fatty acids. Chemically, the preparation is iodized ethyl-esters of oleic acid. Neo-iodipin has an extremely low viscosity, which renders it specially suitable for injection. It is non-irritant, and is more readily absorbed than iodipin. Indicated in tertiary syphilis, arteriosclerosis, angina pectoris, and asthmatic conditions; also as a contrast medium for X-ray purposes in bronchography, myelography, pyelography, hysterosalpingography, and radiography of the urethra and bladder. Supplied in strengths of 20 per cent and 40 per cent iodine. (H. R. Napp Ltd., 3 & 4, Clements Inn, W.C.2.)

Per-Abrodil is a new radiographic contrast agent for excretion urography, given by intravenous injection. The chemical formula is 3:5-di-iodo-4-pyridon-N-acetate of diethanolamine. Per-abrodil represents the latest advance in excretion contrast agents.

It is issued in ampoules of 20 c.c., this being the dose required for an adult. The optimum time for a picture is from eight to twenty minutes after injection.

Per-abrodil may also be used for the demonstration of vascular areas such as varicose veins and anastomoses, for arteriography, etc., and for the examination of joints and fistulae. It is issued in ampoules of 20 c.c., in boxes of 1 and 5 ampoules. (Bayer Products Ltd., 19, St. Dunstan's Hill, London, E.C.3.)

Propidex is an ointment containing a mixed vaccine of streptococci, staphylococci, and *B. pyocyaneus*, specially designed for the local application of vaccine therapy to surface lesions, particularly those of a pyogenic nature. (May & Baker Ltd., Battersea, London, S.W.11.)

Radiographic Examination of Gall-Bladder.—Stipolac Brand Sodium Tetraiodophenolphthalein is issued by Messrs. Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.1, for use in the radiographic examination of the gall-bladder. The product is supplied in two tubes containing (1) Stipolac Brand Sodium Tetraiodophenolphthalein and (2) Stipolac Brand Acid Mixture respectively. The contents of the two tubes are mixed before administration.

Resyl.—This new preparation presents glycono-guaiacol-ether in an elegant and completely absorbable form. It acts as an expectorant and antiseptic in acute and chronic affections of the respiratory organs and is indicated in slight recurrent and febrile cases, tuberculosis, asthma, etc. It has proved a valuable remedy in the treatment of extensive mucus formation in the lungs due to irritation from pollen and other air-borne particles and reflex irritation from the colon.

Resyl is available as a syrup (200-grm. bottles) and in the form of ampoules (boxes of twelve, 2.3 c.c.). The dose of the syrup is 3 to 5 teaspoonfuls daily for adults and 1 to 3 teaspoonfuls for children. Of the ampoules: 1 every second day, the treatment being continued for twenty days, then interrupted for a similar period and repeated if necessary. (The Clayton Aniline Co. Ltd., 40, Southwark Street, London, S.E.1.)

Sal-Ethyl Carbonate.—A chemical compound possessing the analgesic antipyretic action of the salicylic acid compounds, but without their depressing effect or liability to cause gastric disturbances. Sal-ethyl carbonate is insoluble in water and the acid gastric secretions, but decomposes in the alimentary tract and is slowly eliminated, thus giving ample time for absorption. (Parke, Davis & Co., 50-54, Beak Street, London, W.1.)

Sedative Broth Tablets, 'Allenburys.'—Meat and vegetable extracts with sodium bromide (gr. 17 in each tablet) instead of the usual sodium chloride. A particularly pleasant and effective means of administering sodium bromide. Indicated in sleeplessness, anxiety neuroses, epilepsy (in the saltless—'hypochloridization'—treatment), sea-sickness, vomiting of pregnancy, hysteria, neuralgia, various functional disorders, alcoholism, and drug habits. Dosage: from one tablet every other day to three or more tablets daily (when necessary in epilepsy). (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Selvadin is a calcium preparation for intravenous and intramuscular injection. It has the advantage that in spite of its high content of calcium, it can be injected with excellent local toleration. It is rapidly absorbed.

Chemically selvadin is calcium pyrocatechin disulphonate of calcium and sodium, a complex salt with a content of 10 per cent calcium. It is issued in ampoules of 5 c.c., each containing a sterile isotonic, neutral, faintly straw-coloured 9-per cent solution of this complex salt with a glucose content of 1 per cent; 1 c.c. of this solution contains 7 mgrm. of calcium.

Selvadin can be administered in all diseases due to calcium deficiency, in various disturbances of the autonomic nervous system, as urticaria, serum and drug rashes, in inflammatory and exudative disease, such as pneumonia, bronchitis, and tuberculosis, in skin conditions, and to control tendency to hæmorrhage. It may be given in mixed injections with neosalvarsan if necessary.

The dosage is 5 to 10 c.c. several times a day as required; children are given one-half to one-third of this dose, according to age. (Bayer Products Ltd., 19, St Dunstan's Hill, London, E.C.3.)

Sodium Soneryl (Butobarbital).—The salts of soneryl (butylethylmalonylurea) are now being extensively used as pre-operative basal anaesthetics. The hypnotic and analgesic properties, combined with the low toxicity, render sodium soneryl a highly efficient product. Dosage: 2 cachets (0.30 grm.) given the evening before operation, followed two hours before operation by 3 cachets (0.45 grm.). (May & Baker Ltd., Battersea, London, S.W.11.)

Sugarless Expectorant Pastilles, 'Allenburys' Medicated Pastilles, No. 5.—Prepared in response to many requests for cough pastilles suitable for diabetics. Formula: ipecacuanha, gr. $\frac{1}{2}$; squill, gr. $\frac{1}{4}$; balsam of tolu, gr. $\frac{1}{2}$; codeine, gr. $\frac{1}{4}$. Dosage (for adults): about twelve pastilles at intervals during the day. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

S. U. P. 36.—For use in all those infections which, starting with the common cold accompanied by high temperature, pass on with rapidity to influenza, or to pneumonia and bronchopneumonia, the timely administration of S.U.P. 36 before complications have developed serves to abort the attack and to promote a quick and uneventful recovery. A fully descriptive booklet regarding its administration in various conditions may be obtained from The British Drug Houses Ltd., Graham Street, London, N.1.

Tannic Acid Solution, 2.5 per cent, Stable, in ampoules with or without a spray for application. With this solution the practitioner is able, in an emergency, to apply tannic acid to burns in accordance with the procedure recommended in the *Medical Research Council Special Report* No. 141 as being the most successful, since the solution must be stabilized or freshly prepared and should be sprayed on to the affected area. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Ulcerative Colitis Antistreptococcus Serum.—Prepared from cultures of a streptococcus isolated from cases of ulcerative colitis and considered by Bargen and others to be of direct etiological significance in a large percentage of cases of chronic ulcerative colitis. Extended clinical trials at the Mayo Clinic and elsewhere have shown that in the majority of cases marked improvement follows its administration. (Parke, Davis & Co., 50-54, Beak Street, London, W.1.)

Vitamin Products (B. D. H.).—A booklet dealing with the B.D.H. Vitamin Products will be of particular interest at the present time. The British Drug Houses are pioneers in the manufacture of concentrated vitamin preparations.

Under the section 'Radiostol' it will be noted that this preparation is the original irradiated ergosterol used in medical practice; it is also the first example of a vitamin made in the form of pure crystals. Originally the total product of the irradiation was used medicinally, but now Radiostol is isolated from this total product in the form of pure crystals of Vitamin D; it is this pure vitamin that is contained in Radiostol Solution and Radiostol Pellets, the two biologically-assayed and standardized preparations which act specifically in rickets and other skeletal defects resulting from Vitamin D deficiency.

Radiostoleum is also of particular interest inasmuch as it is the original concentrated preparation of Vitamins A and D used in medicine. Furthermore, it possesses the additional advantage accruing from its vitamin content. Radiostoleum is contained in Radio-Malt together with standardized amounts of Vitamins B₁ and B₂. Radio-Malt is now so widely used as a routine measure that its name has become a 'household word' not only in the homes of this country but in all parts of the world.

Avoleum is a highly-concentrated solution of Vitamin A from mammalian livers. It is a natural product in every sense of the word, and may be regarded as being free from Vitamin D. It is standardized in accordance with the most accurate known methods. Avoleum is not intended in any way to replace Radiostoleum, but to some extent to supplement it. It is more suitable for use in the prophylaxis and treatment of bacterial infections when the administration of Vitamin A in massive doses is necessary, and also for elderly patients. (The British Drug Houses Ltd., Graham Street, London, N.1.)

Zephrol is a preparation consisting of ephedrine hydrochloride chlorbutol, and other essential oils. Recent research has shown it to be of the greatest benefit to sufferers from hay fever, rhinitis, and other allied disorders. Application up each nostril every three to four hours will effectively afford protection against colds, influenza, etc., to which the subject may have been exposed. (May and Baker Ltd., Battersea, S.W.11.)

MEDICAL AND SURGICAL APPLIANCES.

Airways.—Owing to the difficulties of getting airways of the size ordered, Dr. F. F. Waddy, anaesthetist to the Northampton General Hospital, has asked Messrs. Mayer and Phelps, 59-61, New Cavendish Street, London, W.1., to make up a set in standard sizes, using specially vulcanized rubber, which he has found most durable.

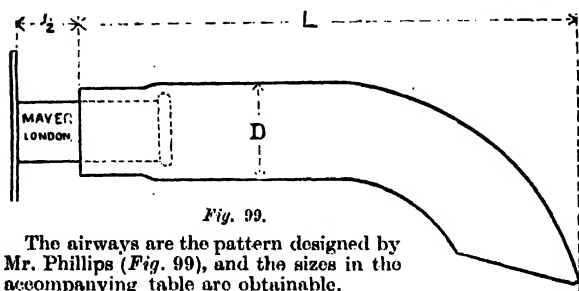


Fig. 99.

The airways are the pattern designed by Mr. Phillips (*Fig. 99*), and the sizes in the accompanying table are obtainable.

No.	L-LENGTH		D-EXTERNAL DIAMETER	
		ins.		inch
1	2	1/2	1	1/2
2	3	3/4	1	3/4
3	3	3/4	1	3/4
4	3	3/4	1	3/4
5	4	1	1	1
6	4	1	1	1
7	4	1	1	1

Anæsthesia: A New Slot Valve.—A New Slot Valve (*Fig. 100*) has been introduced for use in the administration of gas and oxygen with or without ether. It has been found most helpful in anæsthetics, especially in maternity work during labour, and in dental anæsthetics. The valve is a standard fitting and can be used with the ordinary Clover's apparatus or with the facepiece alone. It gives instantaneous control, allowing

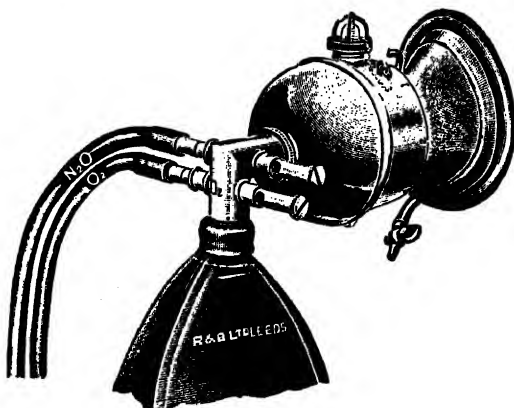


Fig. 100.

gas and oxygen in any proportion, and enables a small and portable gas and oxygen or gas, oxygen, and ether apparatus to be taken to the patient's home.

It can be used with the Clover's ether apparatus for rapid induction of gas anæsthesia, which may be continued by ether, with or without oxygen.

A small nosepiece with expiratory valve is supplied for use in dental work. (Reynolds & Branson Ltd., 12-13, Briggate, Leeds.)

Anæsthetic Apparatus for Nitrous Oxide.—A most compact General Practitioner's Nitrous-Oxide Outfit has been put up by Messrs. A. Charles King Ltd., 34, Devonshire Street, London, W.1, who specialize in anæsthetic apparatus. The whole outfit is kept when out of use in a special oak case measuring 16 in. × 8 1/2 in. × 7 1/2 in. when closed; so that it is not only kept clean, but the rubber parts being shut up will not readily perish; they are, incidentally, guaranteed for twelve months. When the case is opened (*Fig. 101*) the front forms a very stable foot-stand for the cylinders, the apparatus being all assembled and kept ready for immediate use.

In the small brochure sent out will be found a few hints on nitrous oxide anæsthesia, being an extract from *Anæsthesia and Anæsthetics*, by Drs Rood and Webber. The makers will be pleased to send a copy to any medical practitioner desiring it.

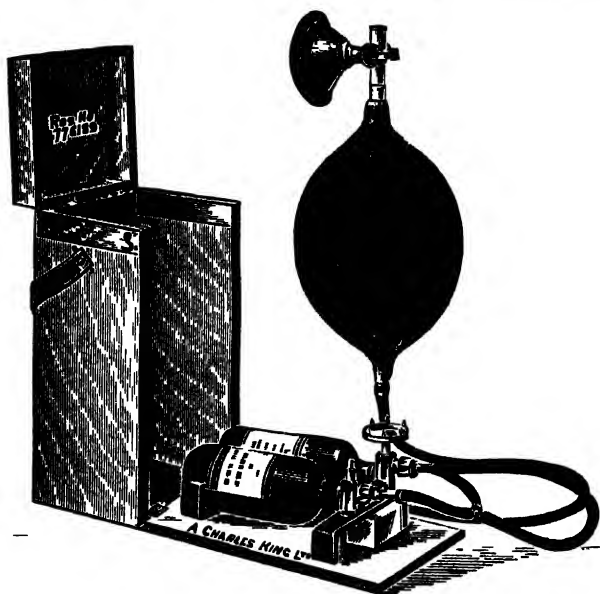


Fig 101

Anæsthetic Inhaler. A new inhaler for open anæsthesia (Fig 102) has been designed by Dr J. Ross Mackenzie, of Aberdeen. This is an Ogston's mask in which the upright frame is enclosed by a permanent metal covering in place of a folded towel.

The metal covering has apertures, one on top, one on each side and one on the anterior wall, the total area of which practically equals the completely open top of the ordinary mask. All the principles of perhalation anæsthesia are therefore retained with this mask. These apertures prove a great convenience to the anaesthetist for renal, mastoid,

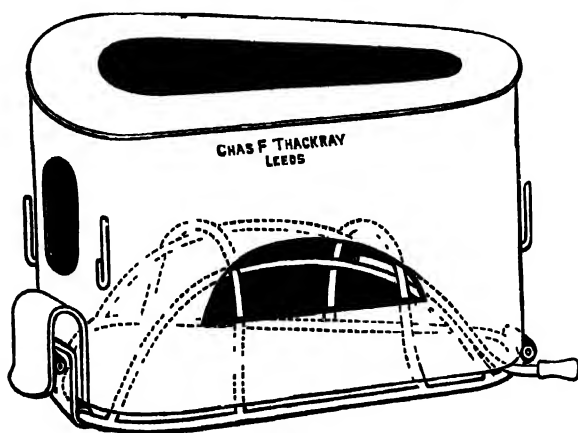


Fig 102

and spinal operations, or for dissection of neck glands, thyroidectomy, and the Trendelenburg position, because ether can be dropped on the gauze with precision no matter what the position of the head of the patient on the operating table.

The mask is fitted with a tube running under the gauze so that oxygen or carbon dioxide, or both, can be supplied to the patient. The metal also has hooks for harness to retain the mask in position. The apparatus is made by Mr. Chas. F. Thackray, Park Street, Leeds, and 252 Regent Street, London, W.1.

Anæsthetic Mask.—This new mask (*Fig. 103*), of the Schimmelbusch type, is made with grooves from the cross-piece forming a bridge, and provided with a funnel. By this means the anæsthetic is distributed evenly over a larger area of the lint or gauze, and there is less likelihood of a surplus coming in contact with the face. The price is 9s. 6d. (Reynolds & Branson Ltd., 12-13, Briggate, Leeds.)

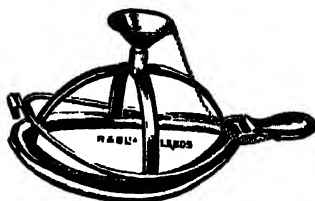


Fig. 103.

Anæsthetic Mask for Ophthalmic Use.—Dr. R. Burns, of the Durham County and Sunderland Eye Infirmary, describes a new mask (*Fig. 104*) which

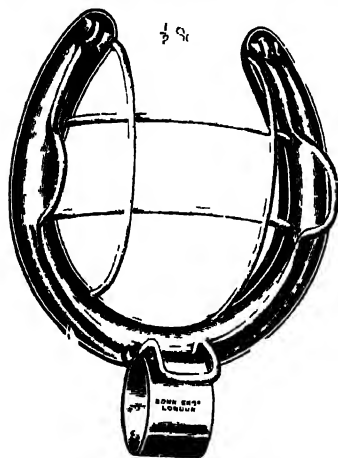


Fig. 104.

consists of a hemispherical wire dome on a horse-shoe-shaped gutter. There is no bridge of wire at the nasal end. In practice, any mask which straddles the nose is in the surgeon's way, particularly during operations in the lower lid and lachrymal sac regions. The mask invariably gets pushed off the nose, allowing too great an air leak.

This mask rests just at the end of the nose. The gap between the ends of the horseshoe gutter is bridged by the lint, which is intended to be worked up with the finger into a hood. This hood covers closely the lowest half-inch or so of the nose, and can be accommodated to any average-sized nose by merely working up with the finger, or pulling on the lint at the sides. The mouth and nostrils are thus closely covered, while the mask is as far away from the operator as possible.

Other useful features are loops in the clamping wire at the sides to allow of the passage under the lint of a tube from the oxygen cylinder or Junker's bottle. The idea is that of Shipway's mask, but the soldered-in metal tubes were not thought necessary, as a medium-sized rubber tube is clamped quite tightly enough to prevent accidental falling away, and a ring handle, modified from Dunder-

dale's, is fixed to the chin end of the gutter. The makers are Messrs. Down Bros. Ltd., St. Thomas's Street, S.E.1.

Apron.—A rubber apron of soft texture, which may be sterilized by boiling and folds into small space, has been brought to our attention by Messrs. Reynolds & Branson Ltd., 12-13, Briggate, Leeds. Being of a light grey colour it is not noticeable, and is found specially useful in midwifery. The price is 6s.

Armourplate Glass.—This is annealed plate glass which resists sudden changes of temperature and will withstand concussion without fracture. It will also support three or four times as much weight as ordinary glass and bends before breaking. (Allen & Hanbury Ltd., Bethnal Green, London, E.2.)

Artificial Limbs.—Mr. Charles Desoutter has now put on the market a cushion foot-joint (*Fig. 106*) which is a distinct improvement on anything hitherto supplied. Wearers of existing models find it necessary from time to time to adjust and oil the joint mechanism and to fit new rubbers in position. They will certainly do well to try this new type of joint. The trouble and expense of repairs and adjustments are practically eliminated. We know of an instance where the model has had hard and continuous wear for eighteen months, without any attention or adjustment whatever, and is still perfectly efficient. By the introduction between the foot piece and the leg piece of a cushion unit which requires no lubrication, the normal action of the gastrocnemius muscle in walking has been closely imitated and more elasticity given to the gait. The resistance of the cushion is regulated according to the weight of the wearer, and the joint is altogether a most workmanlike job.

The construction is simple: the so-called cushion-joint unit being fixed to the foot by a single nut, the tightening of which does not affect the working of the joint. The

nut itself is locked by a serrated washer, and the whole is sealed by a sunken disc. The action can be regulated to suit every type of amputation.

The foot is attached to a shin piece, drawn out of a flat sheet of duralumin to avoid any danger of seam corrosion and breakage, and thus it combines strength and lightness (*Fig. 106*). The knee and thigh piece of the Desoutter limb is also solid drawn and its perfect shape has no ugly gaps

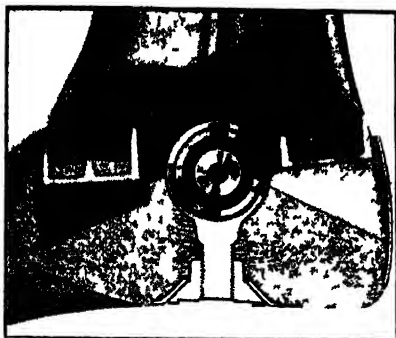


Fig. 105

or projections. There is a specially designed high duty compound ball bearing knee joint, made from Kayser Ellison oil hardening steel, and a totally enclosed adjustable spring return to knee and special shock absorbing silent check cord. This check cord is instantly adjustable with a simple key allowing the knee lock to be suited to all strengths of stump.

The chief fitting centre of the Desoutter Service is at 73, Baker Street, London, W 1, with branches at ten provincial centres, as well as in Wales, Scotland, and Ireland.

Aural Speculum—The 'Auro-lite' (*Fig. 107*) is a very handy and inexpensive instrument for the student or general practitioner.

The lamp, of blue glass giving a daylight appearance, is housed in a hooded reflector which prevents the light shining back into the user's eyes. The glass window and the speculum are detachable, and various sizes of the latter, interchangeable, are available. The battery is of the 'fountain pen' type and is concealed in the handle, which has a spring switch for making contact.

The 'Auro-lite', with one speculum, complete in a leatherette case, costs 17s. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E C 1.)

Auriscopes, Electric.—It is not often that we receive 'Student' instruments, but here is one which merits the special attention of all fourth and final year students—a new Student type Electric Auriscope for use in conjunction with the popular Ever Ready fountain pen torch (*Fig. 108*). The head of this auriscope is so designed that the torch is simply pushed in and the instrument is then ready for use. As the illustration shows (*Fig. 109*), the light is thrown directly into the aperture of the speculum, giving an excellent view of the membrana tympani. Both the back lens and the speculum are detachable and of the same type as supplied on the standard auriscope. A medium speculum is fitted, but additional specula of any aperture can be supplied.

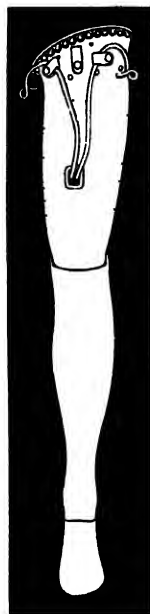


Fig. 106



Fig. 107.

The advantages of the Student type auriscope are its low price of 10s. and the fact that it can be used with the ordinary half-crown torch or purchased with Locklite

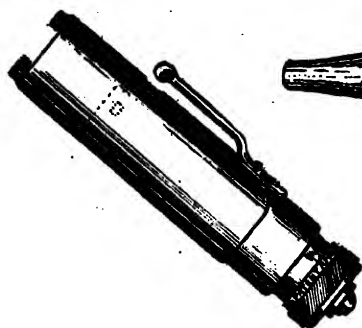


Fig. 108.

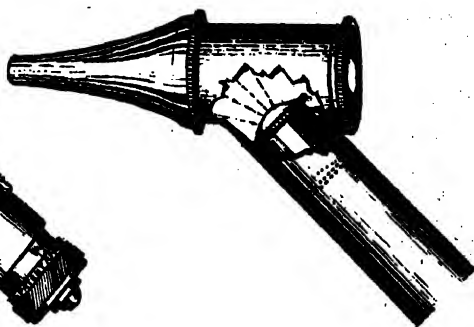


Fig. 109.

torch fitted with a continuous light switch at 15s. complete. The makers are Messrs. John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow, W.2.

Bed Pan in Stainless Steel.—In conjunction with other utensils and equipment in 'Staybrite' Stainless Steel, Mr. Chas. F. Thackray, of Park Street, Leeds, and 252, Regent Street, London, W.1, has now introduced the perfectly designed 'Perfection' Bed Pan (Fig. 110), specially made by Sankeys Ltd. Great economy is effected by

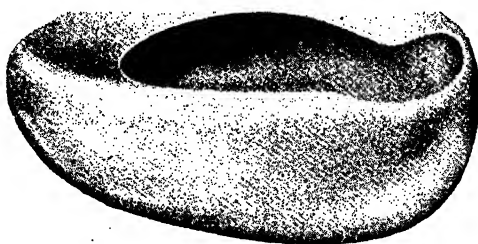


Fig. 110.

the use of the 'Staybrite' stainless steel bed pans, as they are to all intents and purposes indestructible, and in addition will not stain or corrode, are easily cleaned, and remain permanently aseptic. They will not crack, break, or chip in any way as with enamel iron and earthenware bed pans, so totally eliminating any danger of infection to the patient from this source.

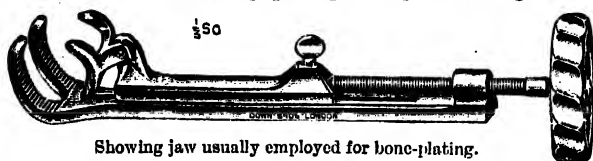
Biopsy Trocar (Delcourt's).—This instrument (Fig. 111) is for taking a specimen of suspected tissue from subcutaneous tumours for pathological study as an aid to diagnosis.



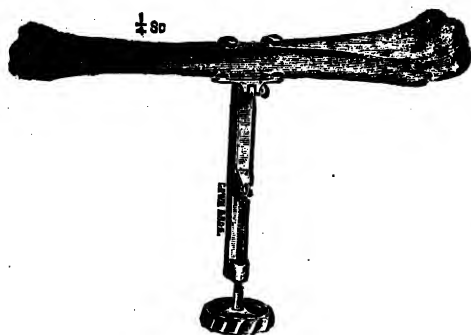
Fig. 111.

The specimen is obtained by making a small puncture wound and removing through the cannula without contaminating the intervening normal tissues. Price 15s. (Donald M. Gaw, Chapel Walks, Liverpool.)

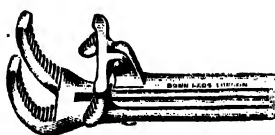
Bone Clamp for Fractures.—Mr. A. Simpson-Smith, of Guy's Hospital, has designed a bone clamp (*Fig. 112*) the chief advantage of which is the easy maintenance of absolute fixity of fragments when bone-grafting, plating, wiring, or binding with fascia.



Showing jaw usually employed for bone-plating.



Clamp in position, showing clearance for twin saw.



Showing interchangeable jaw giving clearance for bone-grafting, etc.

Fig. 112.

It has an interchangeable upper jaw, so that when a maximum surface of bone is desired *between the upper and lower jaws*, as in bone-grafting, or when a thin bone, such as the radius, is being operated upon, a second narrower jaw can be immediately fitted. The makers are Messrs. Down Bros. Ltd., 21-23, St. Thomas's Street, London, S.E.1.

Bone Drill for passing Wire, Fascia, and Tendon.—This instrument (*Fig. 113*) was designed by Mr. A. Simpson-Smith, of Guy's Hospital, to facilitate the passing of wire, fascia, or tendon through bone. The small drill-head enables comparatively deeply

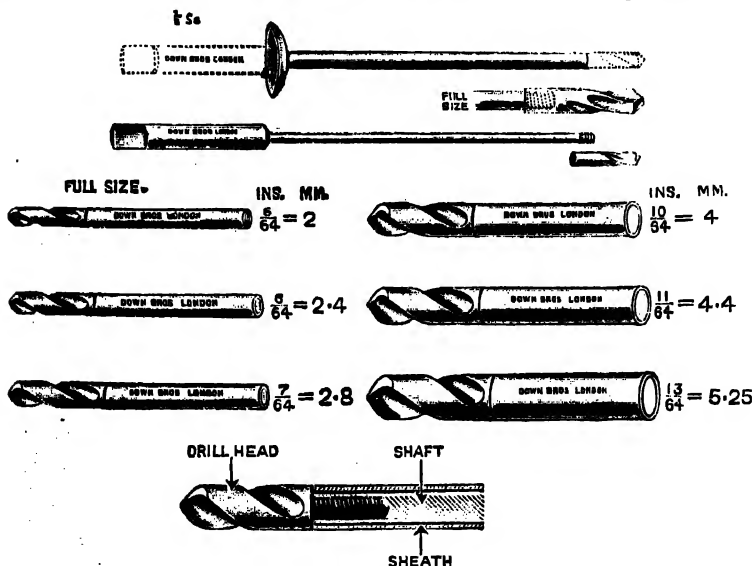


Fig. 113.

situated bones to be drilled, for only a small clearance—the length of the drill-head—is necessary.

The drill is passed through the bone so that the drill-head just clears the opposite side. The assistant grasps the drill-head while the surgeon reverses the drill action, thereby releasing the drill-head. The surgeon then withdraws the shaft of the drill in one movement. Thus, in quick sequence of drilling, reversing, and withdrawing, a cannula is left in the bone through which the desired wire or ligature can be passed. Withdrawal of the cannula completes the operation. Made by Messrs. Down Bros. Ltd., London, S.E.1.

Bone Traction Pin, and Extension Apparatus (Whitchurch Howell's).—This consists of a stainless steel pin with drill point and square end to be inserted in the handle for introduction. The ends of the pin are threaded so that the square loops can be screwed on to the desired width. The dog clips attached to the Y-shaped spreader are fitted to the loops, and a wire cable with hooks is supplied to attach to the spreader and to the weight hanger (*Fig. 114*). Weights are supplied in multiples of 5 lb. so that any desired extension can be obtained. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

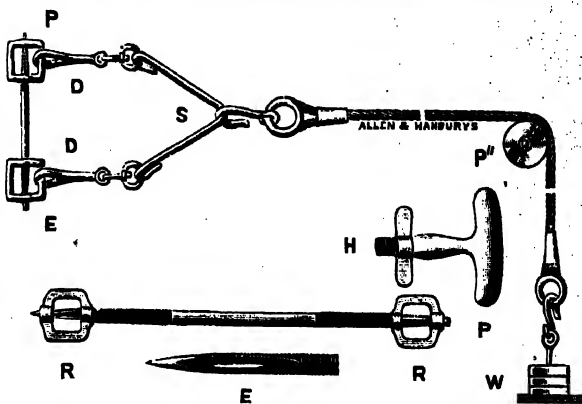


Fig. 114.

Carbon-Dioxide Apparatus (Portable).—

Carbon dioxide has recently come to be recognized as the most effective respiratory stimulant in asphyxia. Hitherto it has been available for this purpose in large and cumbersome cylinders only; now, however, by means of the 'Sparklet' Resuscitators (*Fig. 115*) an adequate

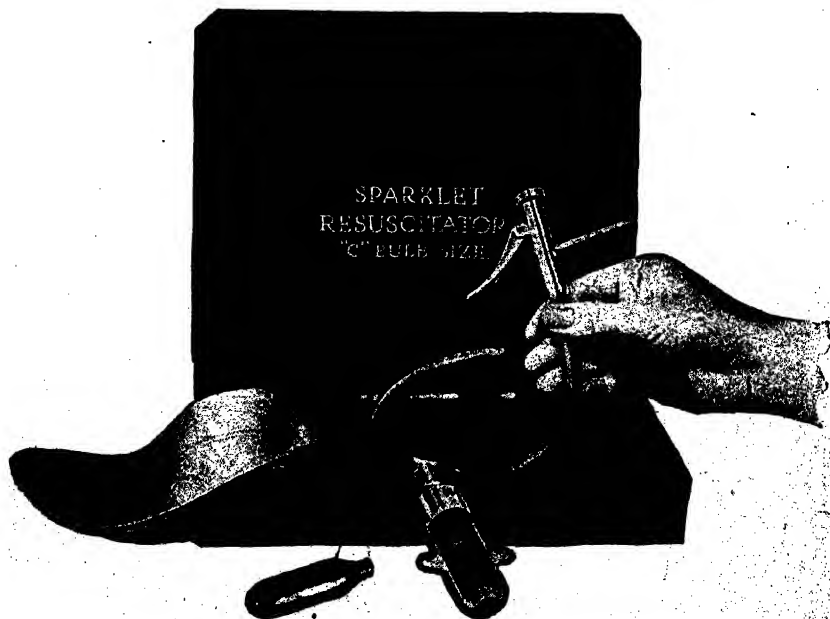


Fig. 115.

and cheap supply of the gas can easily be carried in the physician's or midwife's bag.

If approximately 5 per cent of CO_2 is added to inspired air, pulmonary ventilation is increased 300–400 per cent above normal, that is to say, the volume of ordinary oxygen-containing air which passes through the lungs in a given period is increased by 300–400 per cent, hence the oxygen supply to the lungs is increased. By adding a gentle stream of CO_2 to the inspired air, the desired concentration of about 5 per cent will be obtained.

As the respiratory response is almost instantaneous and easily observed, no accurate gauge of the flow is necessary. The amount to be administered is the minimum that will produce the desired amplitude of respiratory movement. (Whitridge Davies.) (C. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Catgut (A. & H.).—This catgut is made in two varieties—plain and medium hard. The medium hard is suitable for every purpose where a hardened catgut is required.

It is entirely of British origin and sterilized in Messrs. Allen & Hanbury's own laboratories under license issued by the Ministry of Health. (Allen & Hanbury Ltd., Bethnal Green, London, E.2.)

Catheter and Stilette for Induction of Labour.—Mr. D. W. Currie, F.R.C.S., Leeds, writes: Induction of labour by puncture of the membranes, as suggested by Gibbon Fitzgibbon, has been shown to be an efficient means of terminating pregnancy. The instrument illustrated (*Fig. 116*) enables the accoucheur to rupture the membranes through any cervix, whatever the dilatation, with the minimum risk of damage to the

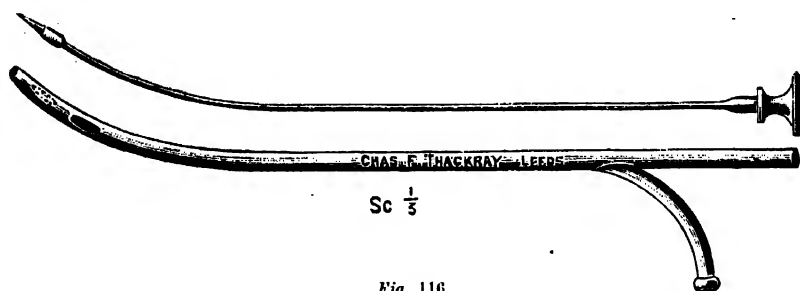


Fig. 116.

mother or child. It consists of a long prostatic catheter with a small side tube; the normal curve has been diminished by half. The stilette when pushed home projects for $\frac{1}{2}$ in. through the tip of the catheter.

The instrument is used as follows: Withdraw the stilette so that the projecting part is within the catheter, pass the catheter through the cervix until it is in apposition with the presenting part separated from it by the membranes. The point of the stilette is now pushed through the end of the catheter and the membranes ruptured by a scratching action.

The liquor amni is made to run away by bobbing the presenting part out of the pelvis or passing the catheter beyond the presenting part into the cavity of the uterus. An anæsthetic is rarely required.

This instrument is made by Mr. C. F. Thackray, Park Street, Leeds.



Fig. 117.

Container for Absorbent Wool.—A metal container for 4-oz. packets of absorbent wool (*Fig. 117*) has been brought to our notice by Messrs. R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool. This can be carried in the surgeon's bag and is always ready for use. The wool can be torn off as illustrated in quantities as required. The price of this useful appliance is 7s. net.

Diagnostic Sets.—In last year's volume we noticed a diagnostic set made by Messrs. John Smith & Son (Glas.) Ltd., the well-known electrical instrument makers of Glasgow. They have since added to their range two 'Super Diagnostic' Sets (*Figs. 118, 119*) with special large-capacity battery handles, a great improvement on any we have yet seen. These sets contain a May electric ophthalmoscope of the latest prism type with patent improved focusing, an electric auriscope fitted with daylight bulb, three speculae all blackened inside to prevent glare, an expanding nasal speculum, a curved laryngeal rod complete with lamp, throat and post-nasal mirrors (which can be sterilized), a tongue spatula with metal blade and a holder to take the popular wooden tongue blades, and a spare bulb.

The large-capacity battery handle is made of duralumin, which is much stronger than the aluminium type previously used, and will take Universal size batteries, which are available in any country in the world. Any two-cell units may be used—'Ever-Ready', 'Helleisen', 'Yalo', 'Bond', or other makes. The handle is fitted with a very efficient rheostat and pocket-carrying clip and 'quick-release' base-cap which can be withdrawn with half a turn; it is cut flat so that the instrument may stand upright. It is claimed that this handle is the most suitable one made for a diagnostic set of this kind, and at their price the sets are excellent value. (*See also Advt., p. xv.*)

The second set (*Fig. 119*) is similar to the one described above, but in addition it has a focusing swivel headlamp mounted on a light headband with flex and plug to work off the battery handle. The handle clips on the breast pocket when used with the head-

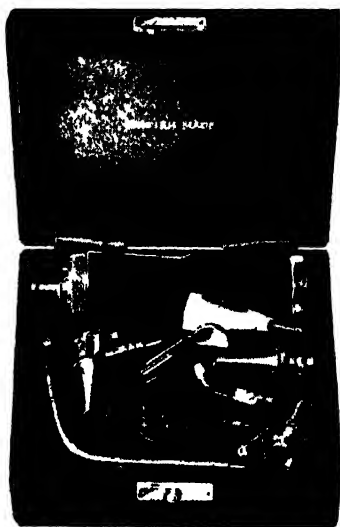


Fig. 118.



Fig. 119.

lamp, leaving both hands free. This headlamp extends the scope of the set to all general examinations, and is especially useful for tonsil, obstetrical work, perineum

suture, rectal and vaginal work, etc. All parts of the sets except the bulbs (for which a spare is supplied) are fully guaranteed. Both sets are British made and are fitted into attractive velvet-lined cases and stamped 'Super Diagnostic'. They may be examined at any Instrument house in Great Britain and the Colonies, and an illustrated folder will be sent to anyone interested by the makers, Messrs. John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow, W.2.

Diathermy Apparatus.—We illustrate in *Fig. 120* the Portable Model Resectotherm, a new diathermy equipment specially adapted for prostatic resection with the Canny Ryall Resectoscope noticed on page 568.

Messrs. Watson & Sons (Electro-Medical) Ltd., Sunic House, 43-47, Parker Street, Kingsway, London, W.C.2, have made this as well as the Hospital Model Resectotherm, the portable model being mounted in two units for convenience in transport. Unit No. 1, with

footswitch, weighs 57 lb., and Unit No. 2, 35 lb. The Resectotherm is a tungsten-spark-gap machine suitable also for general surgical work, provided only that the skin incision is made with a knife. It is not as fast as the Chirotherm valve-operated apparatus made by the same firm, but quite good work can be done.

Fuller particulars will gladly be supplied by the makers or their agent, Mr Chas F Thackray, Park Street, Leeds, and 252, Regent Street, London, W 1

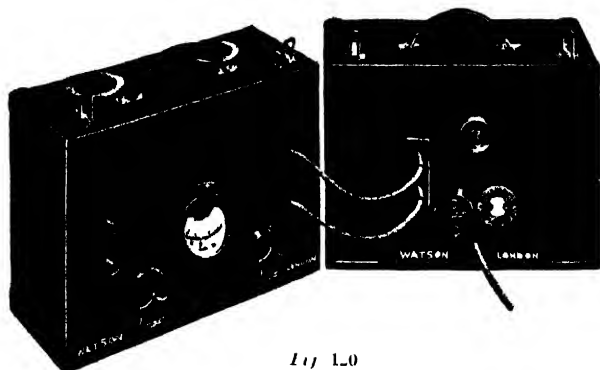


Fig 120

Dietetic Scale— This balance is constructed on the steel yard principle with detachable plate (Fig 121). It is strong, clean and neat and has no loose weights (Allen & Hanburys Ltd, Bethnal Green, London E 2)

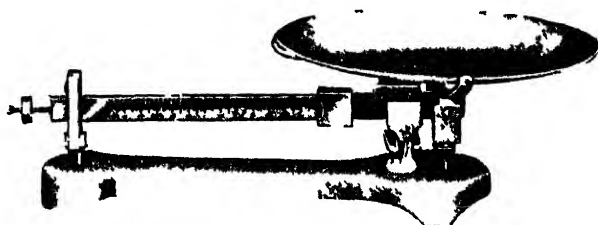


Fig 121

Douche and Enema Attachment The new Lysolat Douche Attachment has been designed to simplify and make more pleasant the task of vaginal douching and to maintain a continuous flow of the disinfectant solution used. A rubber cup, to which is attached a long, flexible rubber tube, is placed on the douche nozzle, and when douching is in progress the waste fluid or used disinfectant is collected by the rubber cup and passes through the rubber tube into any vessel prepared beforehand to receive it. Thus the delicate process of vaginal douching can be accomplished in a clean and simple manner without risk of damping or staining garments or linen. Moreover the waste flow attachment prevents the used disinfectant from being re absorbed by the douche.

The ideal douche is one which allows the disinfectant to flow into and out of the vagina evenly and gently, but when the used fluid is carried away from the person in the same gentle manner then the value and importance of the douche is greatly enhanced. A continuous flow of disinfectant can be maintained for an indefinite period by using the Lysolat douche attachment obviating the necessity of replenishing the disinfectant solution or making repeated injections. Made of superfine rubber the Lysolat douche attachment (see *Addit*, p 150) is entirely British manufacture (Solidol Chemical Ltd, Ashmead House, Disney Street London S E 1)

Drinker Respirator The Drinker Respirator is a mechanical device for the prolonged administration of artificial respiration. The apparatus consists of an enamelled steel chamber which is large enough to accommodate a man 6 ft 4 in in height, and can also be used for a small child. The patient lies on a mattress placed on a truck which is attached to the lid of the chamber. The head and neck of the patient extend beyond the lid through a rubber collar, the head resting on a pad attached to the lid. The lid and truck of the chamber can be pulled in and out with ease to permit or casual examination of the patient, and these measures can be accomplished very rapidly. By means of an electrically driven blower, the pressure inside the chamber is alternately reduced and restored to normal. Both speed and depth of respiration can be varied. Conscious patients can eat, drink, and sleep in the respirator without stopping the mechanism. In emergencies, and without pulling out the bed, enemas and rectal

drips can be administered through rubber stops provided in the side of the machine, and a rectal tube can be inserted by a person reaching in through one of the portholes.

The apparatus has been used successfully in cases of respiratory failure resulting from poliomyelitis, severe carbon-monoxide poisoning, morphine and other drug poisons, alcoholic coma, hiccup, drowning, and, in the small size specially made for babies, in numerous cases of asphyxia in the newborn. It is manufactured by Siebe, Gorman & Co. Ltd., 187, Westminster Bridge Road, London, S.E.1.

Drill for Kirschner's Wire Treatment.—Sven Johansson's breast drill for inserting Kirschner's wires has been further modified by the addition of a chuck, so that this

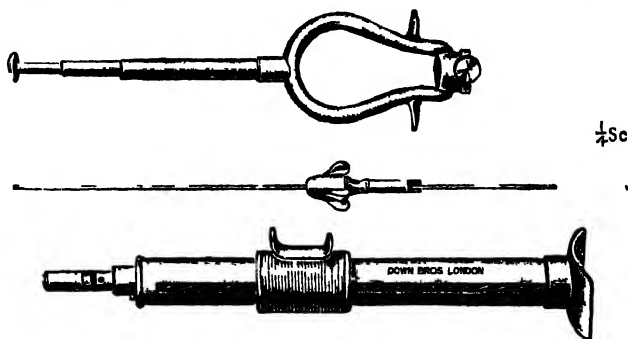


Fig. 122.

drill (Fig. 122) is now useful for all types of Kirschner wires. For convenience of insertion and sterilization, the extending telescope is made to remove. This instrument was first described in this country by Mr. W. H. Ogilvie, F.R.C.S., of Guy's Hospital, and the makers are Messrs. Down Bros. Ltd., St. Thomas's Street, London, S.E.1.

Eye Drop-bottles.—We illustrate here a new set of eye drop-bottles (Fig. 123), 1-oz. size, in assorted colours, with improved Fermoids I.R. teats fitted to pipettes, complete in a white erinoid stand.

Price 18s. 6d. net. The bottles can be supplied labelled to instructions at 6d. each extra. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

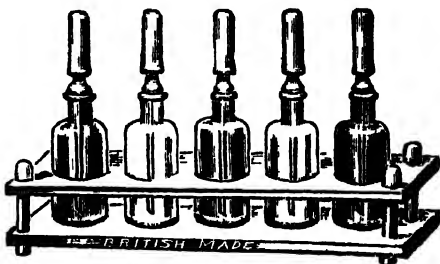


Fig. 123.

FORCEPS.

Biopsy and Skin-Graft Forceps.—The instrument illustrated has been made for Mr. A. Dickson Wright, M.S., by Messrs. Down Bros. Ltd., London, S.E.1, for the purpose of removing small skin strips for grafting chronic ulcers of the legs and those due to burns

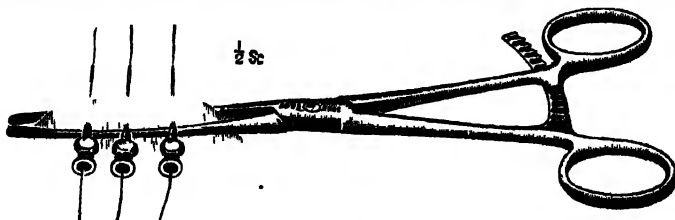


Fig. 124.

by the method of burying seeds or strips of skin below the granulations. This small operation is generally done without assistance in the out-patient department, and is accomplished expeditiously and bloodlessly with the help of these forceps,

The area from which the skin is to be removed is first anæsthetized by infiltration; three hypodermic needles (No. 16 or 23 S. W. G.) are then passed through as shown in the illustration (*Fig. 124*). The strip of skin is now pinched up and steadied with the forceps passed underneath the needles and can be shaved off with scalpel or scissors, all oozing being controlled by the pressure of the forceps. The wound is conveniently closed by threading fine silk worm gut or horse hair through the hypodermic needles before withdrawing them.

The forceps resemble ordinary sinus forceps exactly, except that a rather long ratchet is incorporated in the handle. In addition to the ordinary uses to which sinus forceps are put the instrument is useful for holding the vein on the stretch in the operation of ligation of a varicose vein through a small incision. The removal of small skin tumours and of samples of skin for biopsy is much facilitated by using this instrument.

Hirschmann's Hæmorrhoidal Clamp Forceps.—In the instrument illustrated here (*Fig. 125*) the position of the jaws, which are angled on the flat, enables the operator

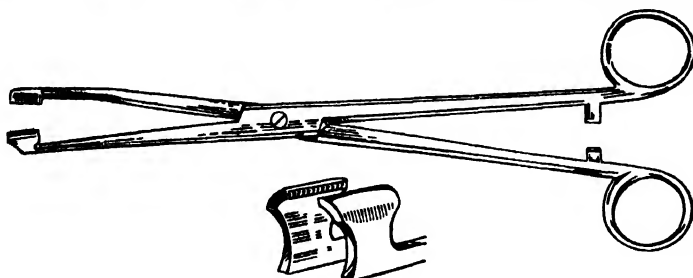


Fig. 125.

to have a better view when in position. Price 18s. 6d. (Donald M. Gaw, Chapel Walks, Liverpool.)

Tongue Forceps.—We illustrate here (*Fig. 126*) a small tongue forceps made for Mr. J. B. Blaikley, F.R.C.S., of Guy's Hospital, for use in the resuscitation of new-born infants. The chief advantage claimed for this instrument is that once the tongue is pulled forward the forceps holds it there by its own weight.

Corboul introduced a self-retaining tongue forceps, but not of a suitably light pattern necessary when applied to an infant. The use of these forceps ensures a clear airway once all mucus is aspirated, while dispensing with an extra hand to hold the forceps; this is particularly of value when carbon dioxide is being administered from a Sparklet apparatus by means of a rubber face mask which fits neatly over the proximal portion of the forceps. In artificial respiration of an infant the operator is not embarrassed by a second person's hand over the chest holding the tongue forwards. The makers are Messrs. Down Bros. Ltd., St. Thomas's Street, London, S.E.1.



Fig. 126.

Tonall Forceps (Miles Atkinson's).—This instrument for opening peritonsillar abscesses



Fig. 127.

(*Fig. 127*) has sharp blades which cut upwards and downwards. It is therefore perfectly safe in use and practically painless. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

Glass Syringe Jar—This jar (*Fig 128*), size 8 × 4 in., with dome top, will keep three or four sizes of Record syringes sterile in solution. The metal stand is chrome plated and is fitted with a lifting device which is locked in position when raised by rotation of a ring to the right. Price 22s 6d each net (R Sumner & Co Ltd, 40, Hanover Street, Liverpool)

Gloves (A & H)—These gloves are made of pure Latex rubber and cured by steam. They will therefore withstand repeated sterilization either by boiling or high pressure steam as well as hot climatic conditions (Allen & Hanburys Ltd, Bethnal Green, London, E 2)

Gloves, Operating—Many surgeons and doctors, especially those abroad, will appreciate the new 'Nupro' Glove (*Fig 129*) which has been specially made by the Mitcham Rubber Co for Mr Chas F Thackray. The process of manufacture employed allows the rubber to retain all its original properties and strength in comparison to the usual method of production which seriously impairs the natural attributes of pure rubber.

Considerable durability is gained by this superior process and the gloves are specially

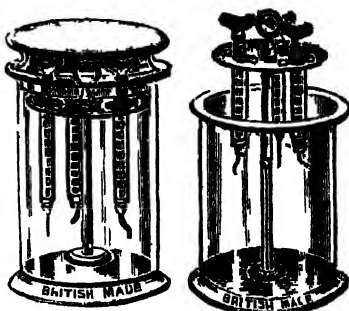


Fig 128



Fig 129

recommended for use in India and the Colonies as they are guaranteed to withstand climatic conditions and resist light to an extraordinary degree.

'Nupro' Gloves are super sterilizable thereby effecting additional economy (Chas F Thackray Park Street Leeds and 252, Regent Street London W 1)

Hæmostatic Bag—This improved hæmostatic bag to control hæmorrhage after prostatectomy is spherical in shape (*Fig 130*) and thus differs from the Picker bag, which is pear shaped. A disadvantage of the latter is that the tapering end when drawn into the urethra may unduly stretch the external sphincter and cause incontinence.

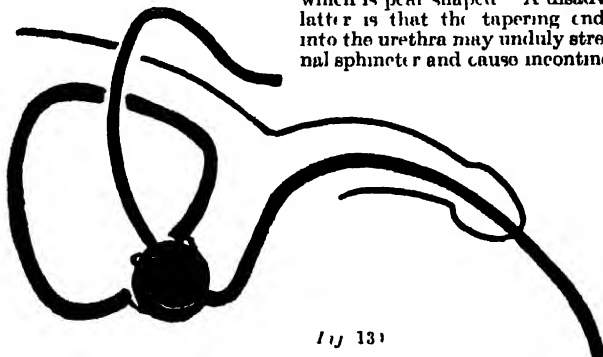


Fig 130

The cavity left after prostatectomy is roughly round in shape and is more accurately plugged by a globular than by a pear shaped bag. A spherical bag, when distended, cannot be drawn into the urethra, hence there is no risk of over stretching the sphincter.

This bag has had an extensive trial at the Royal Victoria Hospital, Belfast, and in private practice, and has proved effective (Mayer & Phelps, 59-61, New Cavendish Street, London, W 1)

Halometer (The Direct)—This instrument (*Fig 131*) is being largely used for the diagnosis, and for recording the progress of treatment, of pernicious anaemia, etc. By means of this halometer the average diameter of the red cells can be obtained in a few minutes, including the time taken to make the blood film. Full particulars of this useful instrument can be obtained from Messrs Allen & Hanburys Ltd Bttnal Green London, E 2



Fig 131

Head Lamp.—The Ever Ready Head Lamp is becoming increasingly popular among members of the medical profession. It has however one distinct disadvantage in that the light is insufficiently concentrated and the reflector throws out an image of the lamp filaments. The Ever Ready lamp here illustrated (*Fig 132*) however, is fitted with a special focusing attachment with a condenser lens and frosted glass bulb which gives a defined circle of light at a distance of about 10 in.

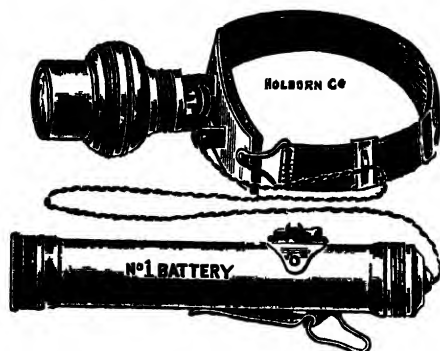


Fig 132

The price of this attachment and frosted bulb is the same as that of the lamp namely 7s 6d making the cost of the complete apparatus 15s. A carrying case in leatherette is also supplied at an extra cost of 5s. (The Holborn Surgical Instrument Co Ltd, 26 Thavies Inn, London E C 1)

Head Rest—This head rest (*Fig 133*), designed by Mr V F Nogus M S is in use at King's College Hospital, and St Thomas's Hospital. It is intended especially for peroral endoscopy, and for all operations on the larynx and the pharynx.

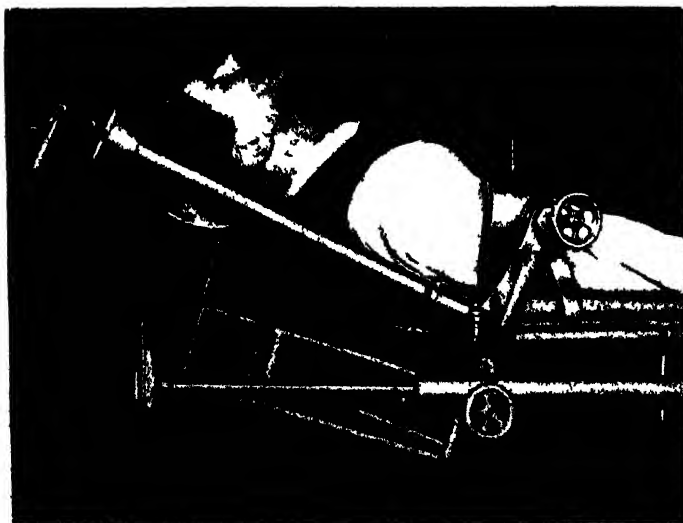


Fig 133

The head cap is adjustable both vertically and horizontally in every direction, and

all movements are controlled by the operator. The arm supports fix the body, preventing any movement of the patient. The sterilizable quiver holds the bronchoscope, mop-holders, etc. (Mayer & Phelps, 59-61, New Cavendish Street, London, W.1)

Hypodermic Needles.—The 'Relief' needles, made in all standard sizes, are of best quality English manufacture, designed to take the place of a hitherto well-known brand of foreign made needle. They have perfect hand set points, and are of a reliable temper, whilst a fluid tight fitting on the syringe nozzle is ensured by soft metal alloy mounts, on which the needle sizes are distinctly marked, and which permit easy threading with cleaning wires (Allen & Hanburys Ltd, Bethnal Green, E 2.)

India-rubber Socks and Mittens.—These have been designed by Dr. Matthew Ray for the treatment of rheumatism. They are loose fitting and fasten with a tape, and by their use the limb can be immersed in hot water for a lengthy period without scalding (Allen & Hanburys Ltd, Bethnal Green, London, E 2)

Laryngeal Mirror.—In the 'Silex' Illuminated Laryngeal Mirror (*Fig 134*) the light is reflected through the glass rod to avoid introducing the lamp itself into the mouth

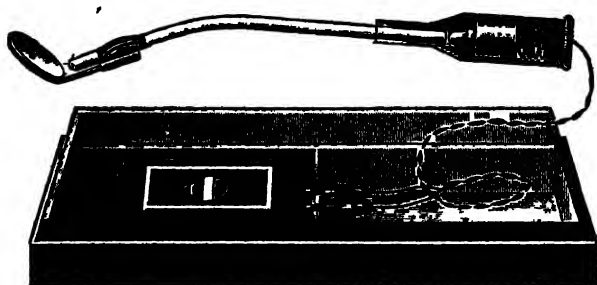


Fig 134

Complete with cords and battery in box, 15s, British made (The Holborn Surgical Instrument Co Ltd, 26, Thavies Inn, London, E C 1)

Laryngo pharyngoscope (Illuminated Direct).—Mr E Watson Williams, F R C S, writes The instrument (illustrated in *Fig 135*) has been used by me for a con

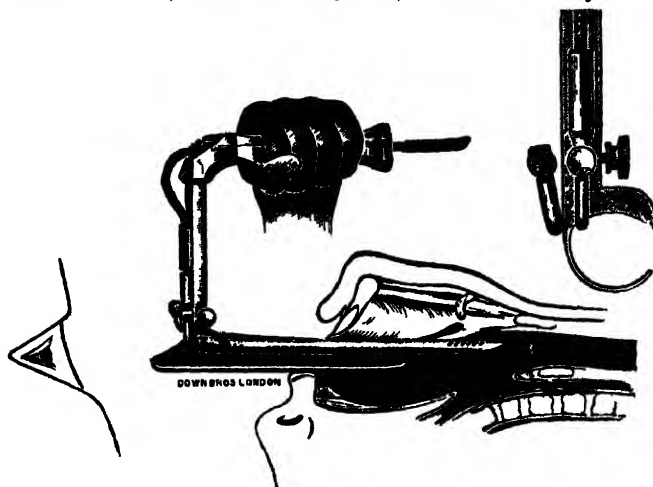


Fig 135

siderable time, and presents definite advantages. It is longer than the usual pattern, and adequate for the largest adult, but owing to the tapering of the end, is convenient

for children two years old. It gives very good exposure for examination of, or operation on, the larynx, and the tip can be passed between the vocal cords. It is useful also as an upper oesophageal speculum, and will reach all foreign bodies in the common site of impaction, immediately below the cricoid. The slotting of the ventral surface near the tip enables the patient to respire through the lumen during such use.

The right side of the 'tube' has been cut away completely, facilitating the passage of instruments. An anæsthetic tube is built into the left wall, abolishing the need for a separate anæsthetic tube, and delivering the vapour well down the lumen. The 'tube' of the instrument is of stainless steel, 20 cm. long, and 16×20 mm. internal diameter; the right wall is absent, a slot of 1 cm. wide being left. Commencing at 8 cm. from the tip the width is gradually tapered to 8 mm. at the tip, which is blunt; at the same time the ventral wall is discontinued, so that the distal 5 cm. is definitely a concave spatula, the concavity gradually lessening toward the tip.

Illumination is by means of a Jackson-type lamp carrier, taking the standard lamps (2.5 m.-amp.) which are carried at the distal end. The handle is also of the Jackson type, but hollow, so that the lamp-flex is carried well away from the upper end during use. Messrs. Down Bros. Ltd., St. Thomas's Street, London, S.E.1, are the makers.

Lipiodol Syringe.—A syringe and catheter (*Fig. 136*) for introducing lipiodol into the lungs by the nasal route has been made for Mr. Philip Franklin, F.R.C.S.

The procedure is very simple. The patient is seated and the neck slightly extended. One nostril, the oropharynx, and the larynx are sprayed with cocaine solution. The catheter is gently passed along the floor of the nose until it reaches the posterior pharyngeal wall, when, with a slightly increased pressure, it passes without any difficulty directly into the larynx because the deglutition reflex has been inhibited by cocainizing the oropharynx. The presence of the catheter in the trachea is proved by listening to the inspired and expired air.

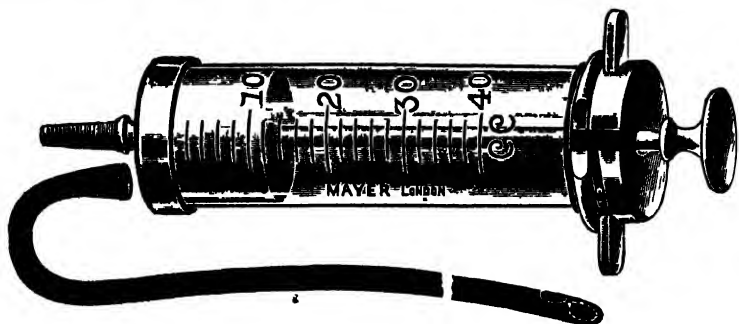


Fig. 136.

Two c.c. of the cocaine solution are immediately introduced through the catheter. The patient is placed on the X-ray table, which is tilted into the Trendelenburg position. The injection of the oil is begun. In this position the oil readily flows into the upper lobe bronchi. To ensure an equal distribution in both lobes, the patient is directed to turn first on to the right side and then on to the left. The oil flow is watched on the X-ray screen. When indicated, a radiogram is taken. This should be done as soon as the bronchial tree appears filled, and before the oil has spread into the alveoli.

The table is now put into the horizontal position and the injection of the oil is continued. As before, the patient is directed to turn first on to the right side and then on to the left. In all, about 40 c.c. of lipiodol are introduced. The filling of the lower lobes is again observed on the X-ray screen, and a radiogram is taken when the whole bronchial tree is clearly visualized. (Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.)

Lithotomy Crutch.—The 'Lithostat' (*Fig. 137*) is a new portable obstetric crutch and lithotomy support designed to completely immobilize the patient during labour, and for all operations where a lithotomy position is required. The apparatus consists of two pieces of chrome-plated steel tube each the shape of half a circle, strong adjustable straps for the neck, and wrist straps.

When in position, the legs are supported in the two curved metal tubes by means of the neck strap, which has a piece of sponge rubber fitted for comfort. It is equally useful for deliveries in the lateral as well as the dorsal position. In the lateral position, the upper leg is fully supported, leaving the operator's hands free.

Light in weight, being only 23 oz., the 'Lithostat' is completely detachable, can be sterilized, and packs conveniently into a small canvas holdall. It is made by Mr. Chas. F. Thackray, Park St., Leeds, and 252, Regent Street, London, W.1.

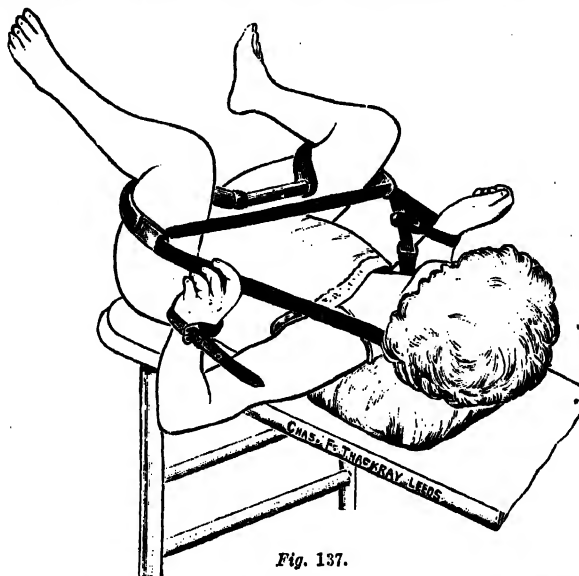


Fig. 137.

Lumbar Cushion for the Operating Table.—Lieut.-Colonel R. C. McWatters, I.M.S., writes: To prevent the backache so common after severe or prolonged operations it is a useful practice to place a small pillow under the lumbar spine, thereby relieving it



Fig. 138.

and the hip-joints from strain. But the pillow is liable to be forgotten, and in certain cases it becomes soiled with blood, urine, or other discharges.

Messrs. Down Bros. Ltd., St. Thomas's Street, S.E.1, supply a sponge-rubber pad (Fig. 138) with a covering of impervious sheet rubber for the operating table, and have modified it to my requirements by thickening it under the lumbar concavity in order to give the necessary support to the back. It is readily cleaned, and, being part of the permanent equipment of the table, it is always in place. I have had it in use for a year, and find that it adds appreciably to the patients' comfort in the days following operation.

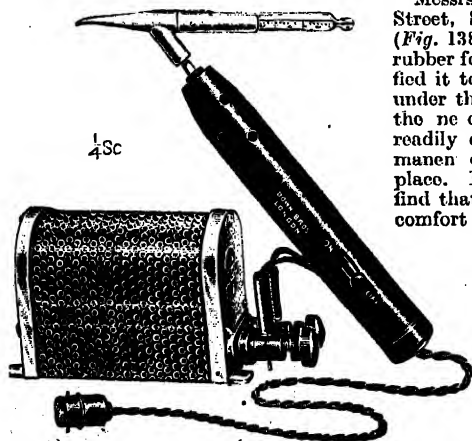


Fig. 139.

Metri-Cautery for Infected Corneal Ulcers.—Dr. A. Christie Reid writes: This instrument (Fig. 139), made for me by Messrs. Down Bros. Ltd., St. Thomas's Street, S.E.1, is an improvement on the design of Professor Wessely and has proved invaluable (a) in arresting septic corneal ulcers that have not yet developed hypopyon; (b) in checking

the progress of severe hypopyon ulcers and leaving even in advanced cases a very moderate scarring allowing sometimes a very surprising degree of vision.

The point should be heated from the main electric supply till the thermometer registers 70°C; it should not be applied over 80°. A gentle stroking of the surface of the ulcer for a few seconds usually suffices.

The process may be repeated later if any fresh advance is noted, but then, as a rule, only to the advancing edge. The instrument has proved in my hands much less damaging than the actual cautery even at a dull red heat and by the 'approach' method, i.e., not touching.

Midwifery Bag (The 'G. P.').—This contains all the essential equipment arranged systematically; no disarrangement can occur as a definite place is provided for each object, and no spilling can take place as all the liquids are in stoppered bottles enclosed in nickel-plated cases.

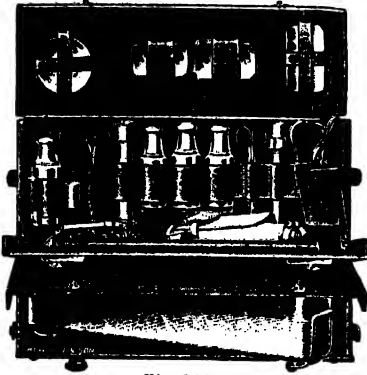


Fig. 140.

This bag (size 18 × 12 × 5½ in.) is so designed that every item is immediately visible and accessible the moment the lid is lifted. In conducting a normal labour the bag can be satisfactorily used in this position, each instrument being effortlessly lifted out from its allotted place. For greater convenience it may be preferred to drop the upper section of the front of the bag to its horizontal position, as illustrated (Fig. 140).

The lid contains nickel-plated cases to hold catheter, hypodermic tablets, ampoules, and perineum needles.

Around the upper compartment are neo-argenticum ointment (colloidal silver with protein) in tube with elongated nozzle; nickel-plated case containing a 2-oz. graduated chloroform drop bottle; two pairs Spencer Wells forceps;

tube of catgut in nickel-plated case; tube of silkworm gut in spirit in nickel-plated case; scissors, 5 in., blunt and sharp points; nickel-plated case; perineum needle holder; and a Schimmelbusch's mask.

On the floor of the upper compartment are baby scales and hammock; one pair of rubber gloves in sterilizable bag; and a rubber apron.

The lower compartment contains midwifery forceps (Milne-Murray's or Neville's axis-traction); and a nickel-plated sterilizer. A fully illustrated circular will be sent on application to the makers. (C. J. Hewlett & Son Ltd., 35-42, Charlotte Street, E.C.2.)

Myringotome (Denis Browne's).—This instrument has a sharp point and can be conveniently used through an aural speculum. The handle is a disc of stainless steel which is held securely with the thumb and forefinger out of the line of sight. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

Operation Table.—The St. Bartholomew's Hospital Pattern improved model operation table (Fig. 141) has a trunk section divided with a joint and the centre can therefore be raised for operations on the gall-bladder and kidney, and lowered to facilitate sewing up the abdominal wall. The table can be supplied mounted on the new platform base which enables the surgeon to sit whilst operating should he so desire. It also gives a greater degree of stability. The top of the table is covered with stainless steel. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

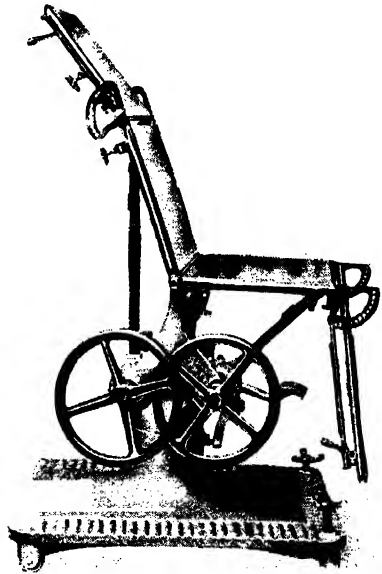


Fig. 141.

Orthopædic 'Horse' (The Shropshire).—This differs from all other orthopædic or plaster tables in that :—

The traction bars may be slid along the bed to any position relative to the patient for traction on arms or legs, whilst at the same time a clear field is left free for radiographic purposes. (*See Advt.*, p. xvii.)

The table is specially designed to tilt in a longitudinal plane in either direction, in order to allow an easy and comfortable approach to the region of the hip-joint. By means of the removable top the surgeon can approach very closely the field of operation.

Capable of infinite adjustment, this apparatus enables a plaster cast to be applied with equal facility to both extremities and to the thorax. It is most rigidly constructed and manufactured by the Medical Supply Association Ltd., 167-185, Gray's Inn Road, W.C.1.

Otophone.—A new aid for the deaf, fitted with two amplifying valves, tone pitch and volume controls, is proving of very great value to deaf people who are unable to hear with the ordinary electric earphone. This instrument is the outcome of many months of experimental work by the Marconiphone Company, and is retailed by the sole distributors, Messrs. T. Hawksley Ltd., 351, Oxford Street, London, W.1.

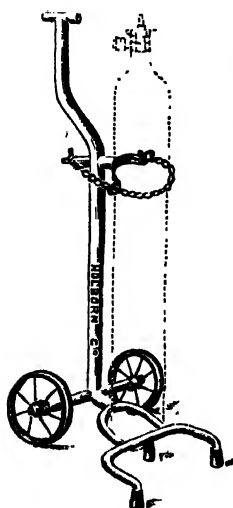


Fig. 112.

Oxygen Cylinder Stand.—The Holborn stand for oxygen cylinders (*Fig. 142*) may be wheeled about in the wards, etc., with one hand; it has an adjustable chain to accommodate all sizes of cylinders. The wheels are easy running and the feet are rubber shod, making it silent in use. Finished in silver bronze or aluminium. Price 30s. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)

Patella Drill.—Mr. A. Simpson-Smith, of Guy's Hospital, has designed a drill (*Fig. 143*) with the head and shaft made as a single unit, and fitting into a shoulder for universal attachment to all bone drills. This device can still be used with ease for

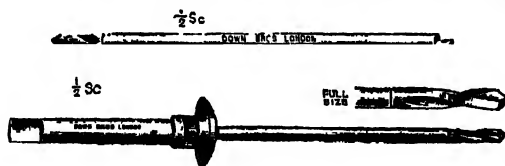


Fig. 113.

fractured patella and tendo-suspension, but cannot be used where there is not a clearance equal to the whole length of the shaft and head, on the contralateral side of the bone. Its usefulness is therefore only very limited and chiefly applicable to the

patella. Mr. Herbert Paterson has brought to the notice of the profession a drill somewhat similar to this earlier pattern. The makers are Messrs. Down Bros. Ltd., 21-23, St. Thomas's Street, London, S.E.1.

Prostatic Resectoscope.—Mr. E. Canny Ryall, F.R.C.S.I., London, writes: Now that the wide applicability of endoscopic resection of the prostate, in skilled hands, is becoming recognized in this country, and several instruments are on the market, I should like to bring to the notice of urological surgeons my latest prostatic resectoscope. After an experience of, virtually, every resectoscope yet presented, I have no hesitation in commending this model as the most perfect yet available.

The instrument differs from that introduced by McCarthy (and from every other with which I am acquainted) in having the telescope, lamp, and loop electrode all moving together on a single carriage activated by the rack and pinion movement. This unique principle secures constant illumination and magnification of the loop. Moreover, the whole of the loop is visible, so that during each cut, whilst the lower portion of the loop is embedded in tissue, the upper part is clearly seen. The whole procedure is thus at all times under visual control. The excursion of the loop is one and a half inches, so that large 'slices' of obstructing prostatic tissue may be reamed out. The loops are rigid and as thick as is compatible with satisfactory cutting in an aqueous medium activated by a relatively cheap spark-gap type of endothermy machine. If a valve type of machine is employed, a thicker and more durable loop may be substituted, but a slower cut is necessary for adequate hæmostasis. The moving needle incorporated in the working parts shown in the upper illustration (*Fig. 144*) is also, I believe, unique. It enables minor obstructions to be infiltrated with local anæsthetic.

and the resection carried out thus painlessly in suitable cases. The large faucets and irrigating system keep the field clear, and in over eighty consecutive cases carried out

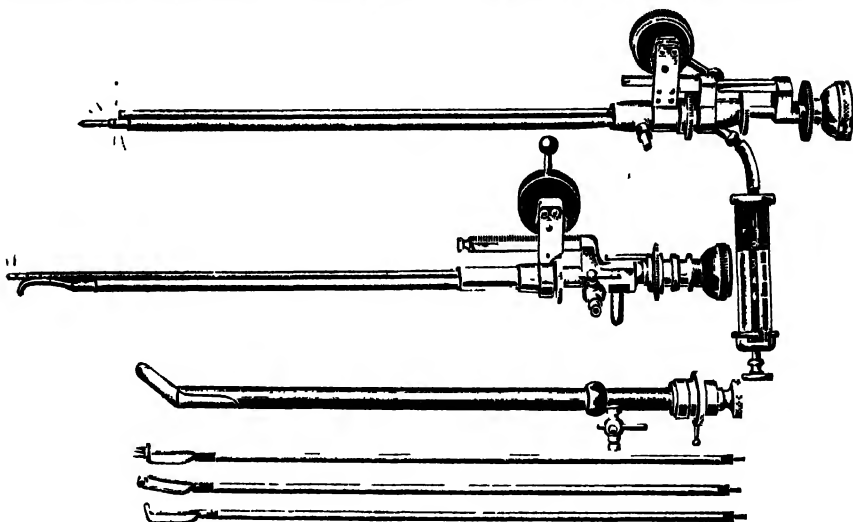


Fig. 144.

by me and my assistant, Mr. Torence Millin, hæmorrhage has caused us no concern whatsoever. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, W.1.)

Radium Needle Inserter and Probe.—Dr. David A. Herd of Liverpool writes: At present radium needle inserting holders and radium needle probes are made as two separate instruments. This entails extra work, waste of time, and unnecessary exposure to the radiation during operation. To obviate this defect, I have designed a combined radium needle inserter and probe (Fig. 145).

Both angled and straight types of instrument are now being successfully used at the Manchester and District Radium Institute. They were made for me by Mr. Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.

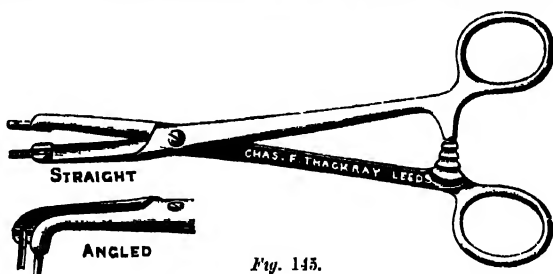


Fig. 145.

Radium Tube.—For applying radium to the œsophagus, Mr. E. Musgrave Woodman, M.S., has had made the rubber tube here illustrated (Fig. 146). It is hexagonal in section (A), with a shoulder which rests on the upper end of the growth, and is made of fairly firm rubber. Parallel grooves extend along the sides, in which the radium is designed to rest (B), and it is retained in position by a thin rubber covering tube (C).



Fig. 146.

There are two advantages of these tubes. In the first place, there is no secondary radiation from the rubber, a fact of importance when metal-carrying tubes are used. In the second place, the tubes, being elastic, move with the patient, and there is no danger of injury to the rest of the œsophagus. (Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.)

Record Syringe Holder, Syringes, etc.—Syringes for use in the production of local or regional anæsthesia need finger grips, so that the solution may be expelled with considerable force, and a locking device for the needle, to prevent it being blown off by the pressure exerted during injection. At the same time it is essential that it should be easy to detach the needle.

Many syringes have been made to fulfil these requirements, but it is sometimes difficult to obtain replacements for a special syringe when it is broken.

A metal sheath has been designed by Mr. H. Upcott, of Hull, to fit the standard 10 c.c. Record syringe and needles, which provides finger grips and a simple swinging lock for the needle, so made that the greater the pressure on the plunger the more securely is the needle held to the nozzle of the syringe. This sheath or syringe holder (*Fig. 147*) is made by Mr. C. F. Thackray, Park Street, Leeds, and London, W.1. Spare Record syringes and needles are always available.

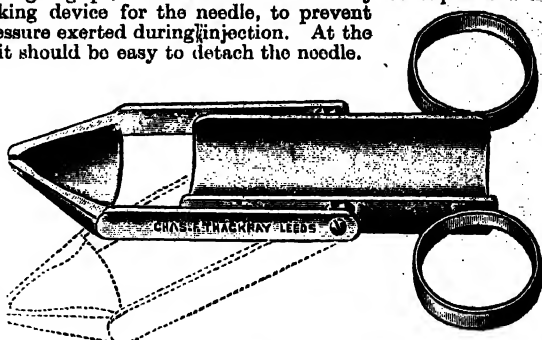


Fig. 147.

Retractor (Winsbury White's).—This self-retaining retractor (*Fig. 148*) has a screw action to facilitate the operation of perineal prostatectomy. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

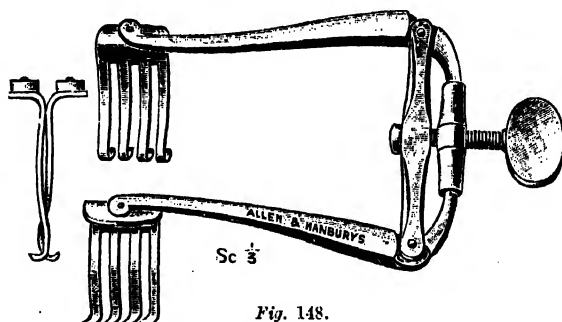


Fig. 148.

Rubber Sheeting.—Thackray's improved 'Vitalast' rubber sheeting has met with unflinching success in all parts of the world. It can now be obtained in a variety of shades, including red, drab, yellow, and black, and in various widths and thicknesses. It is also supplied coloured green, which is very useful for dressing mackintoshes. 'Vitalast' sheeting is particularly suitable for tropical use. (Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.)

Rule, A Pliable.—Dr. David A. Herd of Liverpool writes: Up to the present clinicians have found difficulty in the accurate measurement of lesions occurring on curved or obscured surfaces in the mouth, pharynx, and other sites which are inaccessible to the ordinary ruler. To facilitate such investigation I have designed a pliable rule (*Fig. 149*).

To determine the size of a lesion: bend the pliable wire to desired curve, lay blunt point on further edge of growth, then slide outer tubing until in contact with nearer



Fig. 149.

edge, and read the measurement off on the handle. Suitable finger-rings can be provided and also small slidable indicators for recording several measurements.

Constructed entirely of metal, this rule can be easily sterilized. It is now being used successfully at the Manchester and District Radium Institute and was made for me by Mr. Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, W.1.

Septum Splint.—A splint adapted for the prevention of hæmatoma after submucous resection of the septum has been devised by Sir Robert Woods. It is easy to place and easy to remove, and ensures the patient enjoying a comfortable night with free nasal respiration, and even to indulge in the luxury of blowing the nose.

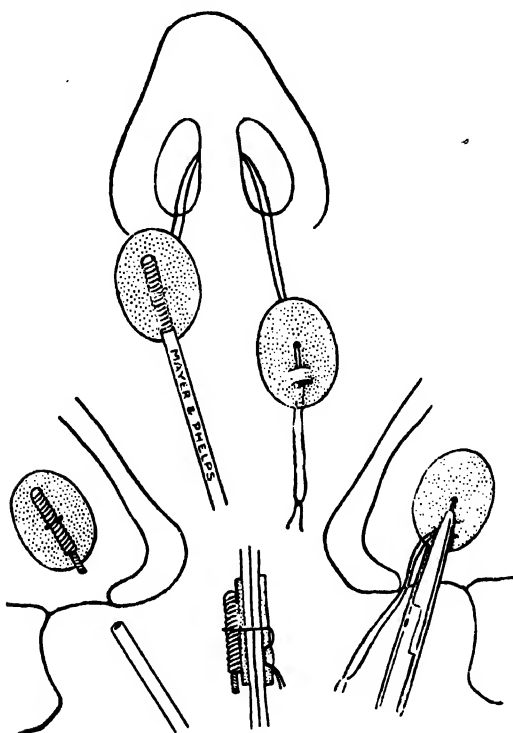


Fig. 150.

The illustration (*Fig. 150*) shows the method of applying the splint. (Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.)

Shelf Hook for Instruments.—This is a new shelf hook (*Fig. 151*) for instrument cabinets, which has a swinging device bringing all the suspended instruments into

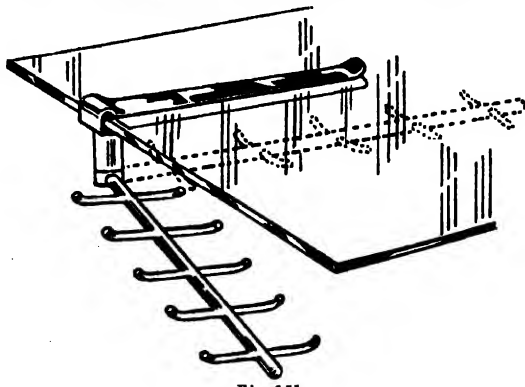


Fig. 151.

view when moved laterally. Price 6s. 9d. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

Sigmoidoscope Scoop.—Dr Arafat, of Guy's Hospital, writes: The necessity of getting a good specimen of the scraping of ulcers commonly found in the rectum and sigmoid in various conditions of ulcerative colitis and proctitis and the different types of dysenteries, or a fresh specimen of the stools, has led me to devise a special scoop (*Fig. 152*), which would be easy to use during a proctoscopic or sigmoidoscopic examination.

The scoop is in one piece, handy to use, and steady in operation, being flexible, it can be bent to use with short proctoscopes like those employed by Dr. Arthur Hurst

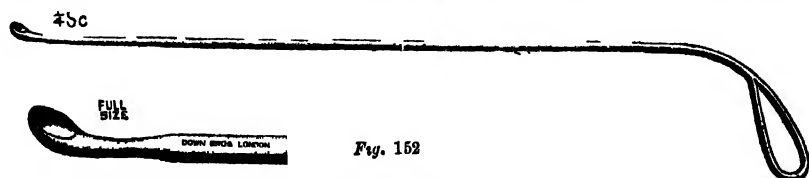


Fig. 152

and Dr Bensaude and can also be of service when taking scrapings through the long proctoscopes and sigmoidoscopes of Strauss and others. The spoon is made of steel, and mounted on a malleable pewter stem. With it I have obtained, through various patterns of instruments, good specimens for immediate cytological and bacteriological examination.

The makers are Messrs Down Bros Ltd, 21 23, St Thomas's Street, London, SE 1. For those who prefer it Messrs Down Bros also manufacture these scoops with rigid shafts as suggested by Mr E C Bowden, of Boscombe.

Skeletal Traction (Max Page's) This appliance (*Fig. 153*) is for the treatment of fractures of the phalanges. The hoop is fastened round

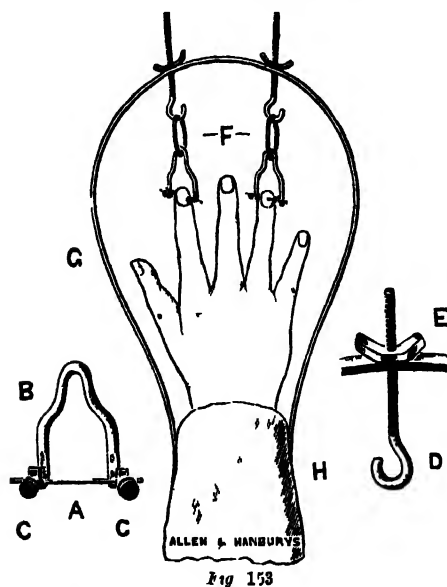


Fig. 153

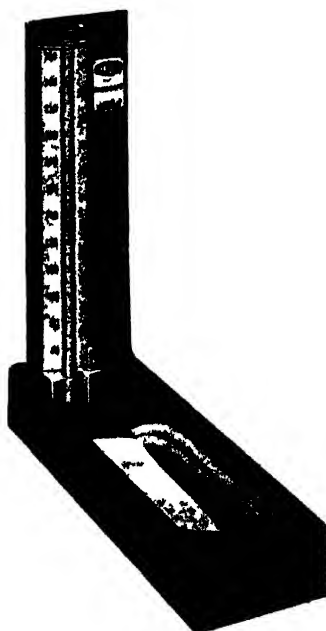


Fig. 154

the wrist with plaster and traction is made on the fingers with wire through the nail, (Allen & Hanburys Ltd, Bethnal Green, London, E 2)

Sphygmomanometer (Accossen).—This mercurial pattern sphygmomanometer (*Fig. 154*) is similar to the well known instrument of American manufacture. It is entirely British and cheaper than the foreign made article. (Allen & Hanburys Ltd., Bethnal Green, London, E 2.)

Sterilizer for Instruments.—This is an electrically heated sterilizer of new design (*Fig. 155*), constructed of heavy copper, nickel-plated, or of stainless steel, with rounded corners, domed lid, and lever action to raise lid and tray simultaneously. Fitted with a three-heat switch, improved immersion heater, and automatic cut-out which operates should the water be allowed to become low. The cut-out can easily be reset by hand after it has operated. This sterilizer is made by Messrs. Allen & Hanburys Ltd., Bethnal Green, London, E.2.

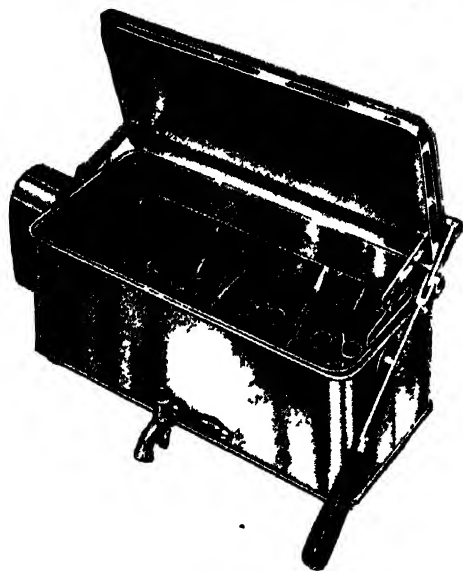


Fig. 155.

Suction Tube (Kindersley's).—

This suction tube has an improvement over other patterns in that it is fitted with a detachable inner tube so that in the event of a choke, the inner tube can be removed whilst the outer remains *in situ*. (Allen & Hanburys Ltd., Bethnal Green, E.2.)

Surgical Sutures and Ligatures.—

Messrs. Davis & Geck, Inc., send us a copy of their "Manual of Surgical Sutures and Ligatures", recently prepared in response to numerous requests for a concise and accurate description of various materials employed for surgical sutures: the sizes and varieties best adapted to the various tissues; approved methods for handling sutures in the operating room; and the factors governing

their behaviour under varying physiological conditions.

This is a most handy and practical guide. Copies are available without charge or obligation to members of the medical profession, nurses, and students, and may be obtained from Mr. Chas. F. Thackray, Park Street, Leeds.

Suspension-Retractor.—A suspension-retractor for pelvic operations (*Fig. 156*) has been designed by Mr. Alfred Gough, F.R.C.S., of Leeds, who writes: In the more difficult pelvic operations, the Trendelenburg position and some form of retractor are necessary in order to obtain proper access to the field of operation. The usual practice has been to support the patient in the inclined position by means of shoulder rests; and, when a Doyen retractor has been used, this has been attached to a special leg-piece or to a chain and weight. It occurred to me to simplify such operations by using the retractor to suspend the patient, the patient's weight supplying the retracting force. With the help of Mr. C. F. Thackray, of Park Street, Leeds, the idea has been developed in the following manner.

A bridge made of a half-inch steel bar is fixed in the slots which at other times accommodate the leg-rests; the details of this fitting will depend on the type of operation table used. The stem of the retractor terminates in a hook which engages in a small loop in the middle of the bridge. The blade is similar to that of a Doyen retractor, but is somewhat

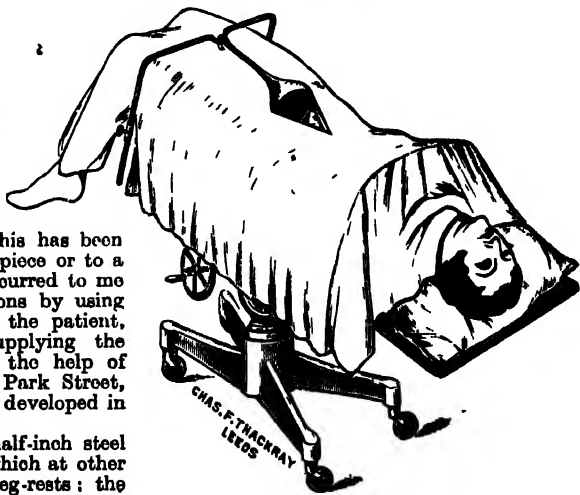


Fig. 156.

The stem of the retractor terminates in a hook which engages in a small loop in the middle of the bridge. The blade is similar to that of a Doyen retractor, but is somewhat

deeper, so as to obtain a secure purchase on the back of the pubic bones: the increased depth also helps to keep the bladder out of the way.

The operation is begun with the table in the horizontal position. The abdominal incision is made, and the 'tetra' cloths attached to the edges of the wound. The bridge and retractor (both sterilized by boiling) are placed in position, and then the table is tilted to the required inclination. The retractor cannot be removed until the table has been lowered almost or quite to the horizontal.

Syringe Outfit (Local Anæsthetic).—Mr. C. Collan-Jones, F.R.C.S. (Swansea) writes: In view of the formidable number of local anæsthetic syringes which are already available to the practitioner, I have hesitated for some years to describe yet another variety. I do not claim any great originality for the apparatus illustrated herewith (*Fig. 157*), nor do I suggest that it presents strikingly novel features; it is the product of my attempts to eliminate the disadvantages of the many other syringes which I have previously employed. The syringe is permanently open at its upper end, so that the piston can be instantly removed and the barrel replenished by pouring in fluid from above. The barrel has a capacity of 30 c.c., and is of specially hardened glass, which is preferable to metal, in that the fluid for injection is fully visible, thus avoiding the risk of air introduction into veins or tissues. A correctly placed peripheral nozzle permits an unobstructed view of the injection field.

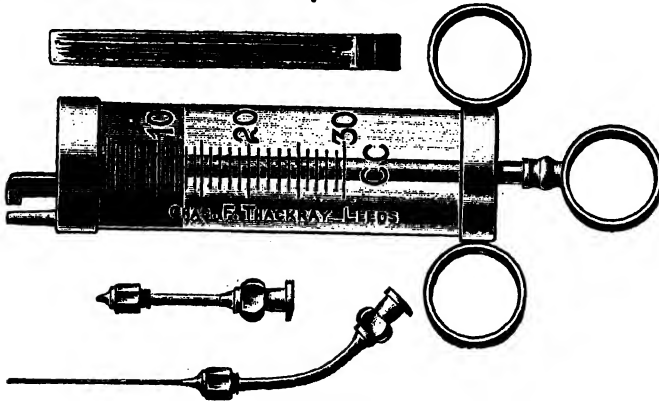


Fig. 157.

Both straight and curved mounts suitable for carrying out injections in all planes are supplied, fitted with adaptors for Schimmel's needles of varying lengths and calibres. The latter have been found to inflict the smallest degree of pain and trauma. Most makes of so-called 'Record' needles can be fitted directly to the nozzle, which will then serve for intravenous injections, for the administration of antitoxins, or for the performance of aspiration. In order to maintain the price of the syringe at a moderate figure, expensive attachments of doubtful practical value have been avoided.

I have used this syringe in anæsthetizing for conditions varying from the removal of sebaceous cysts and unerupted molar teeth to the performance of appendicectomies, gastrotomies, herniotomies, and operations on the head and neck. I have also recently employed it for all intravenous work which demanded the injection of fair quantities of fluid. The instrument is made by Mr. Chas. F. Thackray, Park Street, Leeds, and 252, Regent Street, London, W.1.

Tonsil Dissector with Aspirator.—Mr. A. Lowndes Yates, F.R.C.S. has combined a semi-blunt tonsil dissector with an aspirator in one instrument (*Fig. 158*), so that a bloodless field is secured and all manoeuvres made with that degree of firm precision

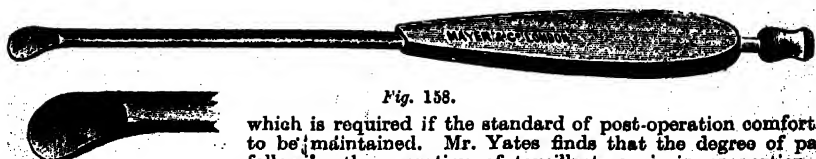


Fig. 158.

which is required if the standard of post-operation comfort is to be maintained. Mr. Yates finds that the degree of pain following the operation of tonsillectomy is in proportion to the degree of trauma which has been inflicted on the tissues. (*Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.*)

Temperature Sensation Testing Instrument.—Dr. H. Wolfe Corner (Maida Vale Hospital) writes: The instrument shown (*Fig. 159*) consists of a neat plated metal piece, forked at one end to carry two special blackened electric lamps, and fitted at the other to slip into the ordinary ophthalmoscope type of battery handle. One of the blackened lamps can be heated from the battery while the other remains cold; the heated surface is sufficiently large to give a definite area of fairly high temperature. It is specially designed to be always available, easily carried inside the ophthalmoscope case, and of no great weight or size; it is extremely valuable in those cases where the more accurate determination of temperature sense is required.

The makers are Messrs. Down Bros. Ltd., St. Thomas's Street, London, S.E.1.

Tonsil Hæmostat.—Mr. Charles Beney has designed a new tonsil hæmostat (*Fig. 160*), which consists of a simple spring clamp with end plates, to which swabs are attached. A special handle, or applicator, facilitates the use of the appliance. In use several of the spring clamps with swabs attached should be sterilized with the dressings.

The main difference between this hæmostat and others lies in the handle being detachable, while it is so designed that there is nothing to get in the way of further operative work in the throat.

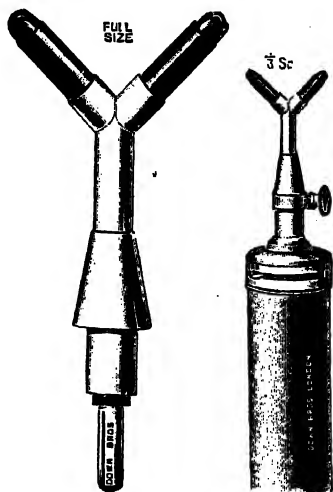


Fig. 159.

hamorrhage after the removal of the first tonsil. In this way time is saved, and unnecessary ligature of vessels avoided. The cost is inconsiderable compared with other more elaborate hæmostats. The instrument has been made by Messrs. Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.

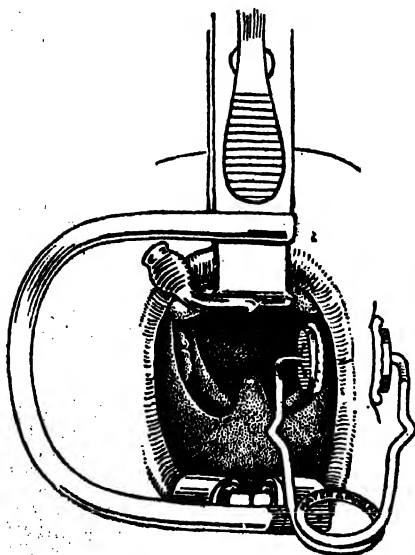


Fig. 160.

Trocar and Cannula.—Mr. Currie, F.R.C.S., of Leeds, writes: During the past eighteen months it has been the custom at the Leeds Maternity Hospital to recover retained placenta by means of a technique first described by Mojon in 1826. Briefly this consists of the injection of the umbilical vein with sterile saline under pressure. The method, which has long been in disuse, was the subject of a paper by J. Jarcho in 1928, in which he detailed the results of three cases.

The results of over fifty injections show without doubt that the method is simple, free from danger, and, what is of more importance, highly successful. It has been used primarily for those cases where the placenta was retained and which in the earlier cases of the series could not be obtained by a Crede under anaesthesia; secondly, to cut short the length of the third stage with the tendency to hamor-

rhage in cases of placenta prævia; thirdly, to obtain the placenta rapidly after instrumental delivery with damage to the soft parts prior to suture; fourthly, to complete an incomplete abortion in which the vein was large enough to inject.

In only two cases was failure experienced and in these the cords were macerated. The value of the manipulation will be appreciated when it is realized that during the past eighteen months only two cases of retained placenta required manual removal at the Leeds Maternity Hospital, and that there was only one death due to post-partum hamorrhage with retention of the placenta. (This was an emergency admission

which died a few hours after the recovery of the placenta by injection.) In the previous five years the placenta had been removed manually on 87 occasions, 28 of these patients becoming morbid, and 14 dying either of sepsis shock or hæmorrhage.

The apparatus (*Fig* 161), made by Mr. Chas F Thackray, Park Street, Leeds, is simple and effective, and can be easily carried in the obstetric bag. It consists of a trocar (B) and cannula (A) with a Higginson's syringe. The trocar and cannula, $3\frac{1}{2}$ in. long, has a diameter of $\frac{1}{4}$ in., and $1\frac{1}{2}$ in from the point is a small metal acorn beyond which a ligature is tied to keep the cannula in the vein. The syringe has an adaptor (C) which fits into the cannula when the trocar is withdrawn.

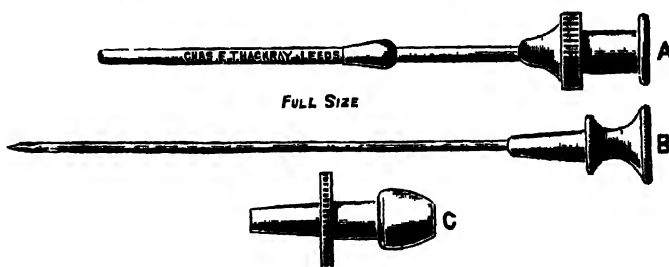


Fig 161

The cord is cleansed with spirit and the trocar inserted into the umbilical vein, i.e., the largest vein of the cord, and ligatured in position. This is easily effected if the cord is tied twice before the child is separated. The syringe is filled with sterile normal saline at blood heat and then attached to the cannula. Saline is injected at the rate of 150 c.c. per minute until contractions are elicited. This usually occurs after the injection of 400–500 c.c. and in most cases before the injection of 900 c.c. The cannula is then withdrawn, the cord compressed with forceps, placed proximal to the site of injection, and the placenta expressed.

Towel Clip (Denis Browne's)—This instrument (*Fig* 162) has sharp prong jaws



Fig 162

similar to Backhaus's but has a weighted end which lies flat and acts as a retractor (Allen & Hanburys Ltd, Bethnal Green, London, E 2)

Twin Saw—The usual model of Albee's twin saw is made with right hand screws to both saws. These screws are apt to creep and the saw has thus a tendency to unlock and alter the width of the graft.

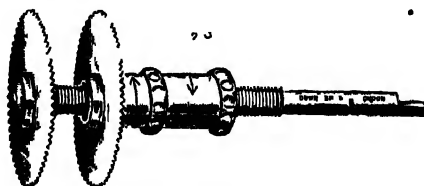


Fig 163.

For Mr McCrae Aitken, FRCS, a model has been made (*Fig* 163) with the second locking nut on a reverse screw so that when the resistance comes on the inner or free blade the two nuts lock each other and the width of the graft remains true. The makers are Messrs. Down Bros. Ltd., St. Thomas's Street, London, S.E.1.

Varicose Vein Retractor.—Mr. A. Dickson Wright, F.R.C.S., has had a retractor and vein stretcher (*Fig. 164*) made by Messrs. Mayer & Phelps, 59-61, New Cavendish Street, London, W.1 for the ambulatory treatment of varicose veins by combination of ligation and injection.

The skin is sterilized and anæsthetized with novocain solution. An incision half an inch long is then made across the line of the vein, and when the subcutaneous tissue is reached the retractor is inserted. The vein is then picked up and freed from connective tissue, the retractor removed and turned round, and the prongs inserted under the vein and separated. Owing to the self-retaining nature of the retractor, the vein is thus kept on the stretch and elevated out of the wound. While so held, 2 c.c. of 5 per cent sodium morrhuate are injected into the lumen of the vein.

The object of this injection is to 'fix' the thrombus which will form, after the ligation, above and below the ligature. Two ligatures of catgut are now passed round the vein, at least an inch apart, and the vein divided between them.

The retractor is useful in other minor operative procedures, usually performed single-handed, where the main difficulties are to keep the wound open and to check oozing. These are overcome by this small instrument.

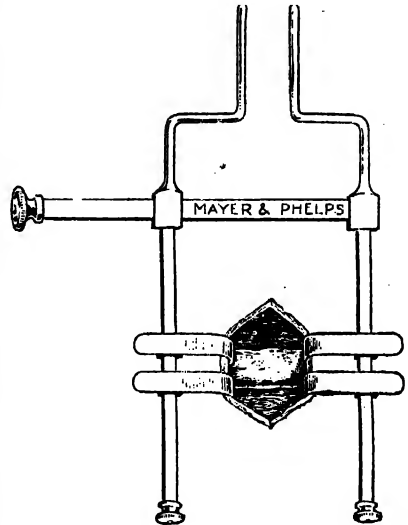


Fig. 164.

Vein Occluder.—This instrument, as will be seen from the illustration (*Fig. 165*), has semi-sharp points and is for straddling the vein by lifting one side slightly. By moving



Fig. 165.

to that side, the vein stands up full under the instrument for the insertion of the hypodermic needle when giving intravenous treatment. Price 5s. 6d. (Donald M. Gaw, Chapel Walks, Liverpool.)

Venoclysis Cannula (Hendon's).—This cannula (*Fig. 166*), for continuous saline infusion, is of silver gilt to prevent corrosion. The end is well rounded and blunt, the



Fig. 166.

openings being at the sides. It is introduced into the vessel beyond its shoulder, and the vein tied behind the shoulder and also in front. (Mayer & Phelps, 59-61, New Cavendish Street, London, W.1.)

BOOKS OF THE YEAR.

A LIST OF THE PRINCIPAL ENGLISH MEDICAL WORKS AND NEW EDITIONS
PUBLISHED DURING THE TWELVE MONTHS ENDING DECEMBER, 1932.

¶ For the convenience of our readers any of the works in this list can be obtained through
Messrs. John Wright & Sons Ltd., Publishers of the 'Medical Annual',
Stonebridge House, Bristol.

AMBULANCE AND NURSING.

- AN A.B.C. FOR SCOUTS AND GUIDES ON MEDICAL AND SURGICAL NURSING. By Florence A. Haig-Brown, S.R.N. Cr. 8vo, pp. 80. Illus. *Witherby* Net 2s. 6d.
- BRITISH RED CROSS SOCIETY FIRST AID MANUAL, No. 1. By St. J. D. Buxton. 6th ed. 18mo, pp. 326. *Cassell* Net 1s. 6d.
- ELEMENTARY HYGIENE FOR NURSES. By H. C. R. Darling. 5th ed. Cr. 8vo, pp. 326. 58 Illus. *Churchill* Net 5s.
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- AIDS TO BIOLOGY. By R. G. Neill. 8vo, pp. 257. *Baillière* Net 3s. 6d.
- ANATOMY (Catechism Series): Part I. 4th ed. *Livingstone* Net 1s. 6d.
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Birmingham City Mental Hospital, Winson Green. Res. Med. Supt., Dr. C. W. Forsyth. Birmingham, $1\frac{1}{2}$ miles; Soho, $\frac{1}{2}$ mile.

Bodmin.—*Cornwall County Mental Hospital*. Res. Med. Supt., Dr. W. G. Rivers. Bodmin station, G.W.R. and S.R., 1 mile.

Box (Wilts.).—*Kingsdown House*. 5 miles from Bath. Res. Med. Supt., Dr. H. C. MacBryan. See also *Advt.*, p. 104

Bridgend.—*Glamorgan County Mental Hospital*. Res. Med. Supt., D. Finlay, M.D. Bridgend, $1\frac{1}{2}$ miles.

Bristol (near).—*Bristolington House*. Res. Physician, Dr. F. E. Fox. Bristol, 3 miles.

Bristol Mental Hospital, Fishponds. Res. Med. Supt., Dr. E. B. White, Clerk and Steward, H. A. Wilkins, F.C.I.S. Fishponds station, 1 mile.

Northwoods, Winterbourne, Bristol. Res. Phys., Joseph Cates, M.D.(Lond.).

See also *Advt.*, p. 11

Bromsgrove (Worce.).—*Worcestershire Mental Hospital, "Barnsley Hall"*. Res. Med. Supt., Dr. P. T. Hughes. Bromsgrove, L.M. & S.R., 2½ miles.

Burgess Hill (Sussex).—*St. George's Retreat*. Licensee, Miss Mary Doran. Med. Supt., Dr. R. D. Pennefather. Burgess Hill station, 2 miles.

Burley-in-Wharfedale (Yorks.).—*West Riding Asylum*, Sealebor Park. Res. Med. Supt., Dr. J. R. Gilmour. Burley-in-Wharfedale station, L.M. & S.R., ¼ mile.

Buxton.—*Wye House*. Res. Med. Supt., W. W. Horton, M.D. Buxton, L.M. & S.R., 10 minutes. See also *Advt.*, p. 113

Caerleon (Mon.).—*Newport Mental Hospital*. Res. Med. Supt., Dr. M. R. Mackay, M.C. Caerleon, ¼ mile.

Cambridge.—*County Mental Hospital*, Fulbourn. Res. Med. Supt., Dr. Travers Jones. Cambridge station, 3½ miles.

Canterbury.—*Stone House*, St. Martin's. Res. Med. Supt., Dr. E. F. Sall. Canterbury East.

Cardiff.—*Cardiff City Mental Hospital*, Whitechurch (Glam.). Res. Med. Supt., P. K. McCowan, M.D., D.P.M., Barrister-at-Law. Llandaff, G.W.R. station, 1 mile.

Carlisle.—*Cumberland & Westmorland Mental Hospital*. Res. Med. Supt., J. T. Herbert Madill, M.B., Ch.B. Carlisle, 3 miles.

Carlow.—*District Mental Hospital*. Res. Med. Supt., Dr. T. A. Greeno. Carlow, ½ mile.

Carmarthen.—*Joint Counties Mental Hospital*. Res. Med. Supt., J. Richards, M.B., F.R.C.S.E. Carmarthen, G.W.R. station, 2 miles.

Castlebar (Co. Mayo).—*Co. Mayo Mental Hospital*. Res. Med. Supt., Alfred Shoridan, L.R.C.P. and S.I. Castlebar, 1 mile.

Chartham (near Canterbury).—*Kent County Mental Hospital*. Res. Med. Supt., M. A. Collins, M.D. Chartham, 1 mile; Canterbury, 3 miles.

Cheadle (Cheshire).—*Cheadle Royal Mental Hospital*. Res. Med. Supt., J. A. C. Roy, M.B., Ch.B. Heald Green, 1 mile. See also *Advt.*, p. 102

Chester.—*Cheshire County Mental Hospital*. Res. Med. Supt., G. Hamilton Grills, M.D. Chester station, 1½ miles.

Chichester.—*West Sussex Mental Hospital*, Graylingwell. Res. Med. Supt., C. G. Ainsworth, M.A., L.L.B., M.B., B.Ch. Chichester station, 1½ miles.

Church Stretton (Shropshire).—*Stretton House* (for gentlemen). Man. Director, S. T. H. Lane. Res. Med. Supt., Dr. J. C. Baker. Church Stretton station, ¼ mile.

See also *Advt.*, p. 110

The Grove House, All Stretton, Shropshire (for ladies). Res. Prop. and Med. Supt., Dr. J. McClintock. Church Stretton station, 1 mile. See also *Advt.*, p. 105

Clonmel.—*District Mental Hospital*. Res. Med. Supt., Dr. J. F. Fitzgerald. Clonmel, 1 mile.

Colchester.—*Severalls Mental Hospital*. Res. Med. Supt., Dr. R. C. Turnbull. Colchester, 1½ miles.

Cork.—*Cork District Mental Hospital*. Dep. Res. Med. Supt., Dr. B. F. Honan and Dr. J. P. Caghinan. Cork station, 1½ miles.

Landville Private Mental Hospital, Cork. Proprietress, Mrs. E. Osburne. Res. Med. Off., Dr. J. C. Osburne. Cork station, 2 miles by tram.

Cupar (Fife).—*Fife District Asylum*. Res. Med. Supt., William Boyd, M.B., Ch.B. Springfield station, N.B.R., ¼ mile.

Darlington (Durham).—*Middleton Hall*, Middleton St. George. Med. Supts., Dr. J. W. Astley Cooper and Dr. T. C. Barkas. Dinsdale station, 1 mile.

Dartford (Kent).—*Stone House*, near Dartford. (Under the management of the Corporation of the City of London.) Res. Med. Supt., Dr. William Robinson. Dartford station, 2 miles.

See also *Advt.*, p. 106

Denbigh (North Wales).—*North Wales Counties Mental Hospital*. Res. Med. Supt., Frank G. Jones, M.B. Denbigh, 1 mile.

Derby.—*Borough Mental Hospital*, Rowditch. Res. Med. Supt., Dr. John Bain. L. & N.E.R. station, 1 mile; L.M. & S.R., 2 miles. See also *Advt.*, p. 107

The County Mental Hospital, Mickleover, Derby. Res. Med. Supt., Dr. E. L. Hopkins. Derby, L.M. & S.R., 5 miles; Mickleover, L. & N.E.R., 2 miles.

Devizes.—*Wiltshire County Mental Hospital*. Res. Med. Supt., S. J. Cole, M.D.

Dorchester.—*Dorset Mental Hospital*. Res. Med. Supt., P. W. P. Bedford, M.D. Dorchester, 3 miles.

Downpatrick.—*Down Mental Hospital*, (155 beds.) Res. Med. Supt., M. J. Nolan, L.R.C.P.I. and S.I. J.P., Downpatrick, 8 miles.

Dublin.—*Bloomfield*, Morehampton Rd. Med. Off., H. T. Bewley, M.D.

Farnham House and Maryville, Finglas, Co. Dublin. Res. Med. Supt., H. R. C. Rutherford, F.R.C.S.I., D.P.H. Motor bus from Dublin, 2 miles.

See also *Advt.*, p. 109

Grangegorman Mental Hospital, Dublin. Res. Med. Supt., Dr. J. O'Connor Donelan. Also *Portrane Branch*, Donabate, Co. Dublin. Dep. Res. Med. Supt., Dr. Stanley Blako. Donabate station, $\frac{1}{2}$ miles.

Highfield (for ladies), Drumcondra; **Hampstead** (for gentlemen), Glasnevin. Res. Med. Supt., Wm. N. Eustace, L.R.C.P.I. and S.I. By rail, Dublin.

See also *Advt.*, p. 110

House of St. John of God, Stillorgan, Dublin. Res. Phys., Dr. J. J. Boland and Dr. F. Whitaker. Stillorgan station, $\frac{1}{2}$ mile.

St. Patrick's Hospital, James's Street, Dublin. Res. Med. Supt., Dr. R. R. Leeper. Branch Asylums at *St. Edmondsbury*, Lucan. See also *Advt.*, p. 98

St. Vincent's Mental Hospital, Fairview, Dublin. Vis. Physicians, John Murphy, F.R.C.P.I., and F. X. Callaghan, F.R.C.P.I. Apply to the Superioress.

Stewart Institution and Hospital for Mental Diseases, Palmerstown, Co. Dublin. Res. Med. Supt., G. H. Keene, M.D. Kingsbridge, $2\frac{1}{2}$ miles.

Verville Retreat, Clontarf, near Dublin. Prop., P. D. Sullivan, F.R.C.S.I. Clontarf, 1 mile.

Dudley (Stafford).—*Ashwood House*, Kingswinford. Prop., Drs. Peacock and Pietersen. Res. Med. Supt., Dr. J. F. G. Pietersen. Stourbridge Junc., $3\frac{1}{2}$ miles; Dudley station, 4 miles; Wolverhampton, 7 miles. Tel.: 19 Kingswinford.

See also *Advt.*, p. 109

Dumfries.—*Crichton Royal*. Res. Med. Supt., Dr. C. C. Easterbrook. Dumfries, 1 mile.

Dundee.—*Baldovan Institution* (for the treatment and education of mental defectives). Res. Med. Supt., D. J. Forbes, M.B., Ch.B. Downfield, 1 mile; Dundee, $4\frac{1}{2}$ miles.

Dundee Mental Hospital, Westgreen, Dundee. Res. Med. Supt., W. Tuach-Mackenzie, M.D. Dundee, 3 miles; Liff, $1\frac{1}{2}$ miles.

Dundee Royal Asylum, *Gowrie House*, Dundee. Med. Off., A. B. Dalgetty, M.D. Sec., J. Wilkie, 27, Bank Street, Dundee.

Durham.—*County Mental Hospital*, Winterton. Res. Med. Supt., Dr. G. F. May. Sedgefield station, $2\frac{1}{2}$ miles, by bus.

Gateshead Mental Hospital, Stannington, Northumberland. Res. Med. Supt., Dr. H. E. Brown. Stannington, L. & N.E.R., $2\frac{1}{2}$ miles.

Sunderland Borough Mental Hospital, Ryhope, Durham. Res. Med. Supt., Dr. M. A. Archdale. Ryhope station, 1 mile.

Edinburgh.—*Edinburgh District Mental Hospital*, Bangour Village, West Lothian. Res. Med. Supt., W. M. McAlister, F.R.C.P.E. Uphall, L. & N.E.R., 2 miles.

Midlothian and Peebles District Asylum. Res. Med. Supt., James H. C. Orr, M.D. Roslynlee, 1 mile; Edinburgh, 12 miles.

New Saughton Hall, Polton, Midlothian. Res. Med. Supt., Jas. H. Skeen, M.B. Polton, 5 minutes; Loanhead, 10 minutes' walk. See also *Advt.*, p. 100

Royal Edinburgh Hospital for Mental and Nervous Disorders, Morningside. Res. Phys. Supt., Professor D. K. Henderson, M.D., Ch.B. Edinburgh, $1\frac{1}{2}$ miles.

Elgin.—*Morayshire District Asylum*. Res. Supt., Miss Annie A. Kinloch. Vis. Med. Off., Dr. A. C. Macdonald. Elgin, $1\frac{1}{2}$ miles.

Ennis (Co. Clare).—*Clare Mental Hospital*. Res. Med. Supt., Dr. F. O'Mara. Ennis, 2 miles.

Enniscorthy (Co. Wexford).—*District Mental Hospital*. Res. Med. Supt., Dr. Bernard Lyons. Enniscorthy, 1 mile.

Epsom (Surrey). *The Silver Birches*, Church Street (for ladies). Licensees, Miss M. L. Oxford (Res.), Dr. E. G. C. Daniel. Southern Rly., 5 minutes. Tel.: 346 P.O. Epsom. See also *Advt.*, p. 113

Essex.—*Brentwood Mental Hospital*, Essex. Res. Med. Supt., Dr. W. Gordon Masefield. Brentwood station, $\frac{1}{2}$ mile.

Littleton Hall, Brentwood, Essex (for ladies). With or without certificate. Res. Med. Supt., Dr. H. G. L. Haynes. Brentwood, 1 mile; Shenfield, $1\frac{1}{2}$ miles.

See also *Advt.*, p. 102

Exeter.—*City Mental Hospital*, Highbys, Exeter. Res. Med. Supt., D. McKinlay Reid, M.D. Exeter, 3 miles.

See also *Advt.*, p. 111

Court Hall, Kington, near Exeter. Res. Licensees, Miss Mules, M.D., and Miss A. S. Mules, M.R.C.S. Starcross, 1 mile.

Deron Mental Hospital, Exminster. Res. Med. Supt., Richard Eager, O.B.E., M.D. Exminster, $1\frac{1}{2}$ miles; Exeter, 4 miles.

Wonford House Hospital for Nervous and Mental Disorders, Exeter. Res. Med. Supt., H. W. Eddison, M.D., D.P.M. Exeter station (Queen St.), $1\frac{1}{2}$ miles; (St. David's), 2 miles.

Fairford (Gloucestershire).—*Fairford Retreat*. Res. Med. Prop., Dr. A. C. King-Turner. Fairford, 1 mile.

Fareham (Hants).—*Knowle Mental Hospital*. Res. Med. Supt., Dr. J. L. Jackson. Knowle, $\frac{1}{2}$ mile; Fareham, $3\frac{1}{2}$ miles.

Glasgow.—*District Mental Hospital*, Woodilee. Res. Med. Supt., H. Carré, L.R.C.P. & S. Lenzie station, 1 mile; Glasgow, 8 miles.

Glasgow District Mental Hospital, Gartloch, Gartcosh. Res. Med. Supt., Dr. A. M. Dryden. Garnkirk station, 1 mile. **Glasgow Royal Mental Hospital**, Gartnavel. Res. Med. Supt., Dr. Angus MacNiven.

Hawkhead Mental Hospital, Glasgow, S.W.2. Res. Med. Supt., Dr. J. H. MacDonald. Crookston station.

Kirklands Mental Hospital, Bothwell, Glasgow. Res. Med. Supt., Wm. M. Buchanan, M.B. Bothwell and Fallside stations, $\frac{1}{2}$ mile; Glasgow, 9 miles.

Lanark District Asylum, Hartwood, Lanarkshire. Res. Med. Supt., Dr. N. T. Kerr. Hartwood, L.M.S. station, $\frac{1}{2}$ mile.

Smithston Asylum, Greenock. Res. Med. Supt., Wm. Loggett, M.D. Greenock West, $1\frac{1}{2}$ miles; Ravenscraig, $\frac{1}{2}$ mile.

Gloucester.—**Barnwood House Hospital for Nervous and Mental Disorders**. Res. Med. Supt., Arthur A. D. Townsend, M.D. Gloucester, 2 miles. *See also Advt., p. 111*

Gloucester County Mental Hospitals, Wotton and Barnwood, Gloucester. Res. Med. Supt., Dr. F. C. Logan. Gloucester station, 1 mile.

Guernsey.—**St. Peter Port Asylum**. Med. Off., C. d'A. Collings, M.D.

Haddington, N.B.—**East Lothian District Asylum**. Supt., Miss Jean Sinclair. Med. Off., H. H. Roberts, M.D. Haddington station, 10 minutes.

Hatton (near Warwick).—**County Mental Hospital**. Res. Med. Supt., A. T. W. Forrester, M.D. Also *Leigh House*, for lady private patients. Warwick, G.W.R. station, 3 miles. *See also Advt., p. 112*

Hawick (Roxburgh, N.B.).—**St. Andrews**, Stitches. Licensee, Sister Mary Agnos.

Haywards Heath.—**Brighton County Borough Mental Hospital**. Res. Med. Supt., G. H. Harper Smith, M.A., M.D. Haywards Heath, $1\frac{1}{2}$ miles.

Hellingly.—**East Sussex County Mental Hospital**, near Eastbourne. Res. Phys. and Med. Supt., F. R. P. Taylor, M.D., B.S. Hellingly station, 1 mile.

See also Advt., p. 108

Henley-in-Arden (Warwickshire).—**Glen-donwell**. Res. Med. Supt., Dr. W. Agar. Henley-in-Arden, G.W.R., $\frac{1}{2}$ mile.

Hereford.—**Hereford County and City Mental Hospital**. Res. Med. Supt., Dr. G. W. H. T. Fleming Barrs Court, G.W.R. and L.M. & S.R., Hereford, 3 miles.

Huddersfield (near).—**West Riding Mental Hospital**, "Storches Hall," Kirkburton. Res. Med. Supt., C. W. Ewing, L.R.C.P. and S.I., D.P.M. Huddersfield, 5 miles.

Hull.—**City Mental Hospital**. Res. Med. Supt., Dr. J. S. Anderson. Willerby station, 1 mile; Hull, 6 miles.

Inverness.—**District Asylum**. Res. Med. Supt., William McWilliam, M.D., D.P.M. Inverness, $2\frac{1}{2}$ miles.

Ipswich.—**The Mental Hospital**. Res. Med. Supt., P. Banbury, D.P.M. Ipswich, 2 miles.

Isle of Man.—**Mental Hospital**, Union Mills, Douglas. Res. Med. Supt., Leslie H. Skene, M.C., M.B., Ch.B., Dipl. Psych. Ed. Union Mills, $\frac{1}{2}$ mile.

Isle of Wight.—**The County Mental Hospital**, Whitecroft. Res. Med. Supt. Dr. C. Davies-Jones. Blackwater, 1 mile; Newport, $2\frac{1}{2}$ miles.

Ivybridge.—**Plymouth Mental Hospital**. Res. Med. Supt., E. G. T. Poynder, M.R.C.S., L.R.C.P., D.P.M. Bittaford, $\frac{1}{2}$ mile; Wrangaton, G.W.R., $1\frac{1}{2}$ miles; Ivybridge, 3 miles.

Jersey.—**Jersey Mental Hospital**. Res. Med. Supt., C. Noble le Brocq, M.D. Gorey Village, 1 mile.

Kilkenny.—**District Mental Hospital**, Kilkenny. Res. Med. Supt., Dr. P. J. Cassin. Kilkenny station, $\frac{1}{2}$ mile.

Killarney.—**District Mental Hospital**. Res. Med. Supt., E. W. Griffin, M.D. Killarney, $\frac{1}{2}$ mile.

Lancashire (near Newton-le-Willows).—**Haydock Lodge**. Res. Med. Licensee and Supt., J. C. Wootton, L.R.C.P., M.R.C.S. Newton-le-Willows, L.M. & S.R., 2 miles. *See also Advt., p. 105*

Lancaster.—**County Mental Hospital**. Res. Med. Supt., R. P. Sephton, B.A., M.R.C.S., L.R.C.P. Lancaster, L.M. & S.R. stations, each $1\frac{1}{2}$ miles.

Leek (Stafford).—**County Mental Hospital**, Cheddleton. Med. Supt., W. F. Menzies, M.D. Wall Grange station, 1 mile.

Leicester.—**City Mental Hospital**, Hum-berstone. Res. Med. Supt., J. F. Dixon, M.D. Leicester, L. & N.E.R. and L.M. & S.R., 2 miles.

Leicestershire and Rutland Mental Hospital, Narborough, near Leicester. Res. Med. Supt., K. K. Drury, M.C., M.D., D.P.M. Narborough, $\frac{1}{2}$ mile; Leicester, 6 miles.

Letterkenny.—**Donegal District Mental Hospital**. Res. Med. Supt., J. C. Martin, L.R.C.P. & S.I., L.M. Letterkenny and Lough Swilly Rly., or Strabane & Letterkenny Rly., 1 mile.

Lichfield.—**County Mental Hospital**, Burntwood, near Lichfield. Res. Med. Supt., W. Reid, M.A., M.B. Lichfield City, $3\frac{1}{2}$ miles; Hammerwich, $1\frac{1}{2}$ miles.

Limerick.—**District Mental Hospital**. Res. Med. Supt., Dr. P. J. Irwin. Limerick, $\frac{1}{2}$ mile.

Lincoln.—**Bracebridge Mental Hospital**. Res. Med. Supt., Dr. John Macarthur, D.P.M. Lincoln, L. & N.E.R., $2\frac{1}{2}$ miles. **The Lawn Registered Hospital**, Lincoln. Res. Med. Supt., Mary R. Barkas, M.Sc., M.D., B.S.Lond., D.P.M. Lincoln station, 1 mile.

Liverpool.—*Shaftesbury House*, Formby, near Liverpool and Southport. Res. Phys., W. G. A. Erakins, M.D. (Edin.). Formby, $\frac{1}{2}$ mile. See also *Advt.*, p. 107

Tus Brook Villa, Liverpool, E. Res. Med. Supt., John Murray Moyes, M.B., Ch.B. Tus Brook station, $\frac{1}{2}$ mile, or Green Lane car. See also *Advt.*, p. 113

London.—*Bethlem Royal Hospital*, Monks Orchard, Eden Park, Beckenham, Kent. Phys. Supt., J. G. Porter Phillips, M.D., F.R.C.P. See also *Advt.*, p. 97

Brooks House, Clapton, E.5. Res. Med. Supt., Dr. Gerald Johnston. Clapton, L. & N.E.R.

Cambervell House, 33, Peckham Road, S.E.5. Senior Phys., H. J. Norman, M.B., Ch.B., D.P.H. See also *Advt.*, p. 106

Chiswick House, Moss Lane, Pinner, Middlesex. Res. Med. Supt., Douglas Macaulay, M.D. Pinner station, $\frac{1}{2}$ mile. See also *Advt.* p. 98

Clarence Lodge, Clapham Park, S.W.4. Res. Licensee, Miss L. Thwaites. Med. Off., Dr. Percy Smith. Clapham Road, and Clapham Common (Electric), 15 minutes. Tel.: 4913 Tulse Hill. See also *Advt.*, p. 108

Fenstanton, Christchurch Road, Streatham Hill, S.W. Res. Med. Supt., J. H. Earls, M.D. Tulse Hill, 5 minutes; Streatham Hill, 10 minutes. Tel.: Tulse Hill, 7181. See also *Advt.*, p. 112

Flower House, Catford, S.E.3. Med. Supt., Wm. F. Umney, M.D. Res. Lic., Mrs. Walter & Beckett. Beckenham Hill, S.R. 5 minutes. See also *Advt.*, p. 111

Halliford House, Upper Halliford, Shepperton, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Sunbury station, $\frac{1}{2}$ miles.

Hayes Park, Hayes, Middlesex. Res. Med. Off., Dr. H. F. Stilwell. Hayes, 2 miles.

Hendon Grove Private Mental Home (ladies only), Hendon, N.W.4. Res. Med. Off. and Licensee, Dr. H. R. S. Walford. Hendon Central (Hampstead Line), $\frac{1}{2}$ mile.

LONDON COUNTY COUNCIL Mental Hospitals (under the direction of the Mental Hospitals Dept., Artillery House, Artillery Row, Victoria Street, S.W.1):—

Banstead, near Sutton, Surrey. Res. Med. Supt., A. A. W. Petrie, M.D., F.R.C.S., F.R.C.P., D.P.M. Belmont station, S.R., $\frac{1}{2}$ mile; Sutton station, S.R., $\frac{1}{2}$ miles.

Bexley, Kent. Res. Med. Supt., G. Clarke, M.D. Bexley station, S.R., $\frac{1}{2}$ miles.

Cane Hill, Coulsdon, Surrey. Res. Med. Supt., G. A. Lilly, M.C., M.A., M.D., B.Ch., D.P.M. Coulsdon South or Coulsdon North, S.R., 10 minutes.

Claybury, Woodford Bridge, Essex. Res. Med. Supt., G. F. Barham, M.A., M.D., B.Ch. Woodford station, L. & N.E.R., $\frac{1}{2}$ miles.

Colney Hatch, N.11. Res. Med. Supt., J. Brander, M.D., M.R.C.P., D.P.M. New Southgate, L. & N.E.R.

Ewell, Epsom. Res. Med. Supt., L. H. Wootton, M.C., B.Sc., M.B., B.S., D.P.M. Epsom, S.R., 2 miles; Ewell, S.R., 1 mile.

Hanwell, Southall. Res. Med. Supt., A. W. Daniel, B.A., M.D., B.Ch. Hanwell, G.W.R., 1 mile.

Horton, Epsom. Res. Med. Supt., W. D. Nicol, M.B., B.S., M.R.C.P., D.P.M. Epsom, S.R., $\frac{1}{2}$ miles.

Long Grove, Epsom. Res. Med. Supt., D. Ogilvy, B.A., M.D., B.Ch., B.A.O. Epsom, S.R., $\frac{1}{2}$ miles.

West Park, Epsom. Res. Med. Supt., N. Roberts, O.B.E., M.D., F.R.S., D.P.M. Epsom, S.R., $\frac{1}{2}$ miles.

Maudsley Hospital (L.C.C.), Denmark Hill, S.E.5. For cases of incipient mental disorders (voluntary boarders only). Med. Supt., E. Mapother, M.D., F.R.C.S., F.R.C.P. See also *Advt.*, p. 55

Mead House, Hayes (for ladies). Med. Licensees, Dr. H. F. Stilwell and Dr. R. J. Stilwell.

Moorcroft House, Hillingdon, Uxbridge, 2 miles. Med. Licensees, Dr. R. J. Stilwell and Dr. G. W. B. James. West Drayton station, 2 miles.

Newlands House, Tooting Bec Common, S.W.17. Private Mental Hospital for a limited number of ladies and gentlemen. Phys. Supt., Dr. Noel Sergeant. Balham station, 1 mile; Trinity Road Station (Underground), $\frac{1}{2}$ mile. Motor bus Nos. 49, 49a, 49b, and 19a. See also *Advt.*, p. 111

Northumberland House, Green Lanes, N.4. Res. Med. Supt., Frederick Dillon, M.D. Manor House station, Piccadilly Underground, and Finsbury Park (G.N.) station. See also *Advt.*, p. 98

Otto House, 44, Sydenham Hill, S.E.26. Lic. Prop., Capt. F. H. Little. Lady Supt., Miss Brodie. West Kensington, 1 mile.

Peckham House, 112, Peckham Road, S.E.15. Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Peckham Rye station, 10 minutes' walk.

See also *Advt.*, p. 108
Springfield Mental Hospital, Tooting, S.W. 17. Med. Supt., R. Worth, O.B.E., M.B., B.S. Wandsworth Common station, 1 mile.

The Priory, Roehampton, S.W.15. Res. Med. Supt., James Chambers, M.D. Barnes station, 10 minutes.

Tooting Bec Hospital (L.C.C.), Tooting Bec Road, S.W.17. For 2313 patients (both sexes). Res. Med. Supt., P. M. Turnbull, M.C., M.B., Ch.B., D.P.M. Balham, S.R., 3 minutes.

West Ham Mental Hospital, Goodmayes, Essex. Res. Med. Supt., Dr. James Harvey Cuthbert. Goodmayes, 1 mile.

Wood End House, Hayes (ladies). Med. Lic., Dr. R. J. Stilwell and Dr. G. W. B. James. Hayes, 1 mile; Uxbridge, 3 miles.

Wyke House, Isleworth, Middlesex. Res. Phys., G. W. Smith, O.B.E., M.B., Ch.B. Edin. Syon Lane and Osterley stations. See also *Advt.*, p. 106

Londonderry.—*District Asylum*. Res. Med. Supt., John Watson, M.C., M.B., B.Ch. Londonderry, 1 mile.

Macclesfield.—*Cheshire County Mental Hospital*, Parkside. Res. Med. Supt., H. Dove Cormac, M.B., M.S., D.P.M. Macclesfield, 1 mile. See also *Advt.*, p. 112

Maldstone.—*Kent County Mental Hospital*. Res. Med. Supt., A. C. Hancock, M.C., M.B., B.S., D.P.H., D.P.M. Maldstone West, 1½ miles.

Malling Place, West Malling, Kent. Res. Med. Supt., Dr. G. H. Adam. Malling station, 1 mile.

Market Lavington (Wilts).—*Fiddington House*. Med. Supt., J. R. Benson, F.R.C.S. Res. Licensee, The Rev. E. Benson. Lavington, G.W.R., 1 mile; Devizes, 6 miles.

Melrose, N.B.—*Roxburgh, Berwick, and Selkirk District Asylum*. Res. Med. Supt., Patrick Steele, M.D. Melrose, 1 mile.

Melton (Suffolk).—*St. Audry's Hospital for Mental Diseases*. Res. Med. Supt., W. Brooks Keith, M.C., M.D. Melton station, 1½ miles; Woodbridge station, 2½ miles.

Menston (near Leeds).—*West Riding Mental Hospital*. Res. Med. Supt., S. Edgerley, M.D. Guiseley, L.M. & S., 1 mile.

Merstham (Surrey).—*County Mental Hospital*, Notherne, near Coulsdon. Med. Supt., Dr. P. C. Coombes. Coulsdon station, 2 miles.

Middlesbro' (Yorks).—*St. Luke's Hospital*. Res. Med. Supt., Dr. H. G. Drake-Brockman. Middlesbro', 2 miles.

Monaghan (Ireland).—*Monaghan Mental Hospital*. Res. Med. Supt., Dr. T. P. Conlon. Monaghan, ½ mile.

Montrose, N.B.—*The Royal Asylum*. Res. Med. Supt., C. J. Shaw, M.D. Dubton, 1 mile; Montrose, 3 miles.

Morpeth.—*Northumberland Mental Hospital*. Res. Med. Supt., Guy R. East, M.D., D.P.H. Morpeth station, 1 mile.

Mullingar.—*District Mental Hospital*. Res. Med. Supt., Dr. Laurence Gavin. Mullingar station, 1 mile.

Newcastle-on-Tyne.—*City Mental Hospital*, Gosforth. Res. Med. Supt., H. D. MacPhail, M.D. Newcastle Central, L. & N.E.R., 3 miles.

Northampton.—*Berrywood Mental Hospital*. Res. Med. Supt., Dr. F. J. Stuart. L.M. & S. (L. & N.W.) station, 2½ miles; L.M. & S.R. (Mid.), 3 miles.

St. Andrew's Hospital, Northampton. Res. Med. Supt., D. F. Rambaut, M.A., M.D. Station, 1 mile. See also *Advt.*, p. 99

Norwich.—*Bethel Hospital for Mental and Nervous Disorders*. Res. Med. Supt., S. J. Fielding, M.B. Cons. Phys., Saml. J. Barton, M.D. Norwich (Thorpe) station, 1 mile. See also *Advt.*, p. 181

City of Norwich Mental Hospital, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Hellesdon, 1 mile.

Heigham Hall Private Mental Hospital, Norwich. Cons. Phys., Dr. G. Stevens Pope, J.P. Res. Med. Supt., Dr. J. A. Small. Norwich station, 1½ miles.

See also *Advt.*, p. 104

Norfolk County Mental Hospital, Thorpe, Norwich. Res. Med. Supt., O. G. Connell, M.C., L.R.C.P. & S. Whittingham, 1 mile; Norwich, 2½ miles.

The Grove, Old Catton, near Norwich (for ladies). Vis. Phys., S. Barton, M.D. Apply to the Misses McLintock.

Nottingham.—*City Mental Hospital*, Mapperley Hill. Res. Med. Supt., G. L. Brunton, M.D. Nottingham, 2 miles.

Notts County Mental Hospital, Radcliffe-on-Trent, near Nottingham. Res. Med. Supt., H. C. Waldo, M.R.C.S., L.R.C.P. Radcliffe-on-Trent, 2 miles.

The Coppick, Nottingham. Res. Med. Supt., David Hunter, M.B. (Camb.). L.M. & S.R. station, 2½ miles; L. & N.E.R. station, 1½ miles. See also *Advt.*, p. 100

Omagh (Co. Tyrone).—*Mental Hospital*. Res. Med. Supt., Dr. J. Patrick. Omagh, 2 miles.

Oxford.—*County and City Mental Hospital*, Littlemore. Res. Med. Supt., T. S. Good, O.B.E., M.A. (Oxon.), M.R.C.S., L.R.C.P. Littlemore station adjoining.

The Warnford, Oxford, 1½ miles. Res. Med. Supt., Alex. W. Neill, M.D. Oxford station, 2½ miles. See also *Advt.*, p. 102

Paisley.—*Craw Road Asylum*. Res. Med. Off., Miss Enid Dixon, M.B., Ch.B. Paisley, 1 mile.

The Mental Hospital, Riccarton, Paisley. Med. Supt., Mary R. Knight, M.A., M.B., Ch.B. Paisley West, ½ mile.

Renfrew District Asylum, Dykebar, Paisley. Res. Med. Supt., R. D. Hotchkiss, M.D. Paisley, 2½ miles.

Perth.—*District Asylum*, Murthly. Res. Med. Supt., Lewis C. Bruce, M.C., M.D. Murthly station adjoins the Asylum.

James Murray's Royal Mental Hospital, Perth (for patients of the middle and upper classes). Phys. Supt., W. D. Chambers, M.A., M.D., F.R.C.P.E. Perth station, under 2 miles.

Plympton.—*Plympton House*, Plympton, Devon. Res. Prop., Dr. J. O. Nixon. Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 6 miles. See also *Advt.*, p. 110

Portloughish (Queen's County).—*District Mental Hospital*. Res. Med. Supt., Dr. Pierce Grace. Portloughish, 1 mile.

Portsmouth.—*City Mental Hospital.* Res. Med. Supt., Thomas Beaton, O.B.E., M.D., B.S. (Lond.), F.R.C.P. Clerk and Steward, John O. Kersey. Fratton, 1½ miles. *See also Advt., p. 105*

Prestwich (near Manchester).—*County Mental Hospital.* Res. Med. Supt., Dr. D. Blair. Prestwich, ½ mile.

Rainhill (nr. Liverpool).—*County Mental Hospital.* Res. Med. Supt., Dr. E. F. Reeve. St. Helens, 2½ miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange,* 5 miles from Sheffield (for Ladies). Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Grange Lane station, L. & N.E.R., ½ mile. *See also Advt., p. 107*

St. Albans.—*Herts County Mental Hospital,* Hill End. Res. Med. Supt., Dr. W. J. T. Kimber. Hill End station. L. & N.E.R. (G.N. Section), 3 minutes. *See also Advt., p. 113*

Napsbury Mental Hospital (under the Middlesex County Council), near St. Albans, Herts. Res. Med. Supt., Arthur O'Neill, O.B.E., M.R.C.S., L.R.C.P. Napsbury, L.M. & S.R., 5 minutes' walk.

St. Leonards-on-Sea.—*Ashbrook Hall,* Hollington (for ladies). Res. Lic., Charles E. H. Somerset. Warrior Square station, 2 miles.

Salisbury.—*Laverstock House,* Salisbury. Med. Supt., J. R. Benson, F.R.C.S., L.R.C.P. Salisbury, 1½ miles. *See also Advt., p. 96*

Old Manor Mental Hospital, Salisbury. Med. Supt., Dr. S. E. Martin. Salisbury station, S.R. and G.W.R., 5 minutes. *See also Advt., p. 108*

Shrewsbury.—*Salop Mental Hospital,* Bioton Heath. Res. Med. Supt., W. S. Hughes, M.B., B.S. Shrewsbury, 2½ miles.

Sleaford.—*Kesteven Mental Hospital.* Res. Med. Supt., N. K. Henderson, B.A., LL.B., M.B., Ch.B., D.P.H., D.P.M. Raucby, L. & N.E.R., ¼ mile.

Sligo.—*District Mental Hospital.* Res. Med. Supt., Dr. John Dunne. Sligo, 1½ miles.

Stafford.—*County Mental Hospital.* Res. Med. Supt., B. H. Shaw, M.D. Stafford, 1 mile.

Coton Hill Mental Hospital, Stafford. Res. Med. Supt., R. MacDonald, M.D., D.P.M. Stafford, 1 mile.

See also Advt., p. 109

Stirling.—*District Mental Hospital,* Larbert. Med. Supt., R. B. Campbell, M.D. Larbert, L.M. & S.R., 1½ miles.

Stone (near Aylesbury).—*Bucks Mental Hospital.* Res. Med. Supt., H. Kerr, M.D. Aylesbury, 3½ miles.

Talgarth.—*Mid-Wales Counties Mental Hospital.* Res. Med. Supt., Dr. P. Drummond. Talgarth, 1 mile.

Tamworth (Staffs).—*The Moat House* (for ladies). Res. Medical Attendant, Dr. W. Lowson. Tamworth station, ½ mile.

Taunton.—*Somerset & Bath Mental Hospital,* Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Norton Fitzwarren station, 2 miles.

Ticehurst (Sussex).—*Ticehurst House.* Res. Med. Supt., C. F. F. McDowall, M.D. Wadhurst, 4 miles, or Ticehurst Rd., 3 miles.

Virginia Water.—*Holloway Sanatorium,* Registered Mental Hospital, St. Ann's Heath. Res. Med. Supt., Henry Devine, O.B.E., M.D., B.S., F.R.C.P. Asst. Med. Offs., Thomas E. Harper, M.R.C.S. (Eng.), L.R.C.P. (Lond.), Cecil Rutherford, B.A., M.B., B.Ch., B.A.O., John G. Hamilton, M.B., B.S. (Lond.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.P.M., Eileen Annie Chennell, M.R.C.S. (Eng.), L.R.C.P. (Lond.), D. P. M. Virginia Water station, 5 minutes. Seaside Branch, St. Ann's, Canford Cliffs, Bournemouth. Med. Off., C. G. Cowie, M.D.

See also Advt., p. 103

Wadsley (near Sheffield).—*South Yorkshire Mental Hospital.* Res. Med. Supt., W. J. N. Vincent, M.D. Wadsley Bridge, 1 mile (goods); Sheffield, 4 miles (passengers).

Wakefield.—*West Riding Mental Hospital.* Res. Med. Supt., Prof. J. Shaw Bolton, M.D. Kirkgate and Westgate stations, 1 mile.

Wallingford (Berks).—*Berkshire Mental Hospital.* Res. Med. Supt., Dr. Walter Woolfe Read. Cholsey, 1 mile.

Warlingham (Surrey).—*Croydon Mental Hospital.* Res. Med. Supt., H. M. Berncastle, M.R.C.S., L.R.C.P. Upper Warlingham, 3½ miles.

Warrington (Lancs).—*Lancashire County Mental Hospital,* Winwick. Res. Med. Supt., F. M. Rodgers, O.B.E., M.D., D.P.H. Warrington, 2½ miles.

Waterford.—*Bon Sauveur Mental Home,* Carrigles, Dungarvan, Co. Waterford. (For ladies.) Conducted by the Order of Bon Sauveur. Vis. Phys., Dr. D. T. McCarthy. Dungarvan station, 3½ miles. *District Mental Hospital,* Waterford. Res. Med. Supt., Dr. Alexis FitzGerald. G.S. & W.R., North station, 2 miles.

St. Patrick's Private Mental Hospital, Belmont Park, Waterford. (For gentlemen.) Conducted by the Brothers of Charity. Superior, Rev. Bro. Regulus Bourke. Vis. Phys., Dr. M. Coghlan. Waterford station, 1 mile.

Wells.—*The Mental Hospital,* Wells. Som. Res. Med. Supt., Dr. J. McGarvey. Wells station, S. & D.J.R. and G.W.R., 1½ miles

Whittingham (near Preston).—*County Mental Hospital*. Res. Med. Supt., Dr. A. R. Grant. Preston, 7 miles.

Winchelsea (Sussex).—*Peritau House*, near Hastings (for ladies). Physician, Harvey Baird, M.D. Winchelsea station, 1 mile.

Woking (Surrey).—*County Mental Hospital*, Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Brookwood station, 1½ miles.

Worcester.—*County & City Mental Hospital*, Powick. Res. Med. Supt., Dr. H. F. Fenton. Worcester station, 4 miles.

York.—*Bootham Park Registered Hospital*, York. Res. Med. Supt., G. R. Jeffrey, M.D. York station, 1 mile.

See also Advt., p. 113

The Friends' Retreat, York. Res. Med. Supt., Dr. Neil Macleod. York station, 1½ miles. *See also Advt., p. 73*

The Pleasaunce, York. Phys. Supt. and Res. Licensee, L. D. H. Baugh, M.B. York, 1½ miles.

North Riding of Yorkshire Mental Hospital, Clifton, York. Res. Med. Supt., Dr. J. I. Russell. York, 2 miles.

York City Mental Hospital, Fulford, York. Res. Med. Supt., Dr. R. A. Hooper. Naburn, L. & N.E.R., 1 mile.

MENTAL DEFICIENCY ACT, 1913: CERTIFIED INSTITUTIONS AND HOUSES.

Class A.—Certified Institutions. *Class B.*—Institutions approved under Section 37.

Class C.—Certified Houses. *Class D.*—Approved Homes.

BEDFORDSHIRE

Bromham House, Bromham, near Bedford. For males. Supt., M. Wallenger. (*Class A.*)

BERKSHIRE.

Cumnor Rise, Oxford. — 34 females. High-grade feeble-minded. Supt., Miss Carter. (*Class A*)

BUCKINGHAMSHIRE.

The Manor House Institution, Aylesbury. For 56 males and 43 females. Supt., Miss E. Boughton. Managers, Bucks Mental Deficiency Committee. (*Class A.*)

Winslow Institution, Winslow. — (For Bucks County cases only.) 9 male, 33 female, adults. Feeble-minded and imbecile. Supt., A. J. Hartley. (*Class B.*)

CARMARTHENSHIRE.

Pantglass Hall, Llanfynydd Road, Carmarthen. For 117 females. Supt., Miss M. C. Treharne-Jones. (*Class A.*)

CHESHIRE.

Ashton House, 26, Village Road, Oxton, Birkenhead. For 40 females (high grade). Supt., Miss O. M. Wilkinson. (*Class A.*)

Sandlebridge, near Alderley Edge. — 378 males and females. Educable mentally defective children under 13 years of age. President, Mary Dendy, M.A. Sec., E. M. Richards, 72, Bridge Street, Manchester. (*Class A.*)

CUMBERLAND.

Dovenby Hall Colony, Cockermouth. — For both sexes. Supt., Miss S. J. Bevan. (*Class A.*)

Durran Hill House, Carlisle. — 65 females. Feeble-minded. Higher grade. Supt., B. Puroell. (*Class A.*)

DERBYSHIRE.

Thornhill, Trowels Lane, Derby. — For females. Supr., Miss S. McGarvie. (*Class A.*)

Whittington Hall, Whittington, near Chesterfield. — 400 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control, 14, Howick Place, Victoria Street, S.W.1. (*Class A.*)

DEVON.

Royal Western Counties Institution, Starcross. — 662 males and females (trainable children and adults). Sec. Supt., C. W. Mayer. (*Class A.*)

Stoke Lyne, Withycombe, Exmouth. — 59 males. Managers, Devon County Council. Supt., Miss H. E. Darlington. (*Class A.*)

DURHAM.

Monkton Hall Home for Lads, Jarrow-on-Tyne. — 79 males. Supt., Mrs. A. H. Piggott. (*Class A.*)

Shotley Bridge Colony, Shotley Bridge, Durham. — 227 males, 173 females. Matron, Miss H. L. C. Yates. (*Class A.*)

ESSEX.

Bigods Hall, R. C. Special School, near Dunmow. — 61 high grade boys. Corresponding Manager, Rt. Rev. Wm. O'Grady, St. George's, Walthamstow, E.17. (*Class A.*)

Brunswick House, Mistley. — For 75 males (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., S. E. Dudley. (*Class A.*)

Elloe House, Church Road, Leyton. — 102 high-grade feeble-minded females over 16. Corresponding Manager, as for Bigods Hall. (*Class A.*)

Royal Eastern Counties Institution Ltd., Colchester. — 1430 males and females, all grades. Med. Supt., Dr. F. D. Turner. (*Class A.*)

South Ockenden Colony, South Ockenden, Essex. — For both sexes. Supt., Miss W. S. Butler. (*Class A.*)

The Mutual Sanatorium, Billericay.—54 males of the middle class. Supt. Sec., Mr. A. J. Read. (Class A.)
Waleham How Home, 1, Forest Rise, Walthamstow, E.17. Hon. Sec., Mrs. Cannon, Church Army, 57, Bryanston Street, W.1. For 45 females. Lady Supt., Miss Stephens. (Class A.)

FLINT.

Coed du Hall, Rhydymwyn, near Mold.—For females. Supt., Miss M. P. Elder. (Class A.)

GLAMORGANSHIRE.

Hensol Castle, near Pontyclun, Glam. For 100 males. *Drymma Hall, Skewen, near Neath.* For 79 females. Res. Med. Supt., Dr. E. Lewis. (Class A.)

GLOUCESTERSHIRE.

Brentnry Colony, Westbury-on-Trym, Bristol.—327 males over 17 years of age. Res. Med. Supt., Dr. G. de M. Rudolf. Clifton Down or Henbury stations, 1½ miles. (Class A.)

Hortham Colony, Almondsbury, near Bristol.—For both sexes. Res. Med. Supt. Dr. Walter Wyatt. (Class A.)

Royal Port Home, St. Michael's Hill, Bristol.—30 females, high-grade mentally deficient. Hon. Sec., Mrs. Brown, "Trecarrel," Rylestone Grove, Parry's Lane, Bristol. (Class A.)

St. Mary's Home, Painswick, near Stroud.—29 females. High-grade feeble-minded. Apply, Lady Supt. (Class A.)

Stoke Park Colony, Hanham Hall, Hanham, near Bristol.—240 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Royal Victoria Home, Horfield.—42 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Stapleton, Bristol.—790 patients of both sexes. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.) See also Advt., p. 72

Stoke Park Colony, West Side, Stapleton.—348 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stapleton Institution, Bristol.—120 adult males, 140 females and 40 children. Superintendent, A. F. Waters. (Class B.)

HAMPSHIRE.

Coldeast Colony, Sarisbury, near Southampton. For 87 females and 50 males. Med. Supt., Dr. A. Wilson. Matron, Mrs. E. K. Bushell. (Class A.)

Mount Tabor, Basingstoke, Hants.—Church of England institution for 50 high-grade females over 16 years of age. Supt., The Mother Superior, Sisters of the Transfiguration. (Class A.)

St. Mary's Home, Alton.—45 mentally and morally deficient females. Managers, The Wantage Community of Sisters. Supt., The Sister Superior. (Class A.)
Tatchbury Mount Colony, West Totton, Southampton.—For males. Supt., W. M. Worlock. (Class A.)

HERTS.

Hillside Special School for Mentally Defective Boys, Buntingford.—48 males under 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

St. Elizabeth's Home for Epileptics, Much Hadham.—56 children; 54 female adults. Apply to Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

St. Raphael's Colony, Barvin Park, near Potter's Bar, Herts.—43 epileptic and mental defective males over 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

Rowley Lodge, Rowley Green, Barnet.—Educational home for 14 very backward boys and girls. Principal, Miss Wall. (Class A.) See also Advt., p. 84

The Middlesex Colony for Mental Defectives, Harper Lane, Shenley, near St. Albans.—302 males. Managers, Middlesex County Council. Res. Med. Supt., Dr. H. E. Beasley. (Class A.)

Leavesden Mental Hospital, Abbot's Langley, Watford, Herts.—For 2159 cases (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., R. M. Stewart, M.D., D.P.M. (Class B.)

Boxmoor House School, Boxmoor, Herts.—10 males under 14, and 10 females. Principals, Misses J. M. and M. D. Isbister. (Class C.)

KENT.

Princess Christian's Farm Colony, Hildenborough.—89 males, 68 females. Managers, National Association for the Feeble-minded. Superintendent, Miss Pitman. (Classes A and D.)

Darenth Training Colony, near Dartford, Kent.—For 2280 cases (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., J. K. C. Laing, M.B., B.S., D.P.M. (Class B.)

LANCASHIRE.

Allerton Priory R.C. Special Industrial School, Woolton, Liverpool.—123 female educable children. Cor. Manager, Rev. J. Bennett, 93, Shaw Street, Liverpool. Supt., Sister A. Pound. (Class A.)

Caldstones, Whalley, near Blackburn.—1192 males, 1534 females. Feeble-minded, imbeciles, idiots, and moral defectives. Managers, Mental Deficiency Acts Committee, Lancashire Mental Hospitals Board, Preston. Res. Med. Supt., Frank A. Gill, M.D. (Class A.)

Dovecot Certified Institution, Knotty Ash, Liverpool. For 65 females. Supt., Miss F. Eyre. (Class A.)

Pontville R.C. Special School, Ormskirk.—121 boys under 16. Mentally defective. Cor. Manager, Rev. J. Bennett, 93, Shaw Street, Liverpool. (Class A.)

Royal Albert Institution, Lancaster.—800 of both sexes. Managers, The Central Committee of the Royal Albert Institution, Lancaster. Secretary, Samuel Keir. (Class A.) See also *Advt.*, p. 72

Seaford House, Waterloo Road, Seaford, near Liverpool.—101 male, 134 female feeble-minded children. Managers, Liverpool City Council, Liverpool. Res. Supt. in Charge. (Class B.)

LEICESTERSHIRE.

Leicester Frith, Groby Road, Leicester. 120 males, 180 females. Supt., Miss N. Russam. Managers, City of Leicester Mental Deficiency Committee, Alliance Chambers, Horsefair Street, Leicester. (Class A.)

LONDON.

South Side Home, Streatham Common, S.W.16. For 80 females (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., Miss H. G. Holl-
 yer. (Class A.)

The Helping Hand Home, 16, Cathcart Hill, N. 29 females. High grade mental defectives. Matron Miss Caleb. Managers, Committee; Hon. Sec., Mrs. Geoffrey Russell, J.P., 17, Church Row, Hampstead, N.W.3. (Class A.)

St. Teresa's, 97, Belmont Hill, Lewisham. For 116 females. Supt., Sister A. Friel. (Class A.)

Fountain Mental Hospital, Tooting Grove, Tooting Graveney, S.W.17. For 670 low-grade unimprovable children (both sexes) Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., J. Nicoll, M.D., C.M. (Class B.)

MIDDLESEX.

All Souls' Special School, Pield Heath House, Hillingdon.—120 educable females under 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

Bramley House, Clay Hill, Enfield.—50 females. Managers, Middlesex County Council. Supt., Miss A. Swift. (Class A.)

Crathorne, Oak Lane, East Finchley, N.—20 women, 13 children. Hon. Sec., Mrs. Cannon, Church Army, 57, Bryanston Street, W.1. (Class A.)

St. Raphael's Institution, The Butts, Brentford.—For females. Supt., Miss A. Dwyer. (Class A.)

Normansfield, Teddington.—150 males and females of all ages. Med. Supt., Dr. R. L. Langdon-Down. (Class C.)

See also *Advt.*, p. 74

Alexander House, 117, High Street, Uzbridge.—24 females over 16. Supt., Miss E. Collyer. (Class D.)

Conifers, Teddington.—22 females, and 3 male children. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

Trematon, Teddington.—24 males. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

NORFOLK.

Luddon and Clavering Institution, Heckingham, Norfolk.—For both sexes. Supt., W. L. Hill. (Class A.)

The Lodge, Bowthorpe Road, Norwich.—6 adult males, 20 adult females. Managers, The Corporation of Norwich. Supt., F. R. Smith. (Class B.)

NORTHUMBERLAND.

Prudhoe Hall Colony, Prudhoe-on-Tyne.—For both sexes. Supt., Miss N. M. Hawkes. (Class A.)

NOTTINGHAMSHIRE.

Rampton State Institution, near Retford.—Both sexes of violent and dangerous propensities. 652 males, 499 females. Med. Supt., F. E. E. Schneider, M.D., D.P.M. Managers, The Board of Control, Caxton House West, Tothill Street, S.W.1. (Class A.)

SOMERSET.

House of Help (Bath Preventive Mission), 112, Walcot Street, Bath.—66 feeble-minded fallen females. Supt., Miss H. D. Stegeman. (Class A.)

Stoke Park Colony, Leigh Court, Abbot's Leigh, nr. Bristol.—260 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Rock Hall House, Combe Down, Bath.—18 males, 20 females. Supt., Miss L. S. Davison. (Class A.)

Yatton Hall, Yatton, near Bristol (ancillary premises to Sandhill Park).—76 of both sexes (65 under 16 years, 11 young women). Managers, Somerset County Council. Supt., Miss J. McGill. (Class A.)

Sandhill Park, Bishop's Lydeard.—101 females and 60 males, of 16 years and over. Managers, Somerset County Council. Supt., Miss T. Wood. (Class A.)

West End House, Shepton Mallet (ancillary premises to Sandhill Park).—91 females of 16 years and over. Managers, Somerset County Council. Supt., Mr. G. S. Gooden. (Class A.)

Cambridge House, Long Ashton, Bristol (ancillary premises to Sandhill Park).—30 females and 66 males of 16 years and over. Managers, Somerset County Council. Supt., Mr. W. Lombard. (Class A.)

STAFFORDSHIRE.

New Cross Institution, Mental Wards, Wolverhampton.—8 males, 3 females. Managers, County Borough Council of Wolverhampton. Supt., T. D. Rollinson. (Class B.)

Sedgley Poor Law Institution, Burton House, Dudley, Stafford.—50 males, 65 females. Managers, Staffordshire County Council. Master, P. Hopkin. (Class B.)

Stallington Hall, Blythe Bridge, Stoke-on-Trent. 33 males, 44 females. Supt., Miss M. A. Cahill. (Class A.)

STIRLINGSHIRE.

The Royal Scottish National Institution, Larbert. For 600 pupils of both sexes and all grades. Res. Med. Supt., R. D. Clarkson, M.D., F.R.C.P. Edin. (Classes A and C.) See also Advt., p. 74

SUFFOLK.

Handford Home, Ranelagh Road, Ipswich.—22 high-grade females. Managers, Ipswich Corporation. Supt., Miss D. B. Miller. (Class A.)

St. Joseph's Home, The Croft, Sudbury.—27 high-grade females. Lady Supt., Sister Catherine. (Class A.)

SURREY.

Eagle House, London Road, Mitcham. For females. Supt., Miss M. Blandford. (Class A.)

Ellen Terry National Home for Blind Defective Children, Wray Park Road, Reigate. For both sexes. Supt., Miss E. M. Cooke.

Farmfield, Horley.—133 males of criminal experience or intractable disposition (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., A. J. Oldfield. (Class A.)

Royal Earlswood Institution, Redhill.—350 males, 180 females. Med. Supt., Dr. S. Langton. Sec., Mr. H. Stephens, 14, Ludgate Hill, E.C.4. (Class A.)

See also Advt., p. 74

The Manor, Epsom.—608 males, 663 females. (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., E. S. Littelljohn, M.R.C.S., L.R.C.P. (Class A.)

Caterham Mental Hospital, Surrey.—For 2103 cases (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., T. Lindsay, M.D., F.R.C.S., D.P.M. (Class B.)

SUSSEX.

The Hermitage Training Home, Fairwarp, near Uckfield. For females. Supt., Miss M. Walton. (Class A.)

Tubwell Farm, Jarvis Brook, near Crowborough. For males only. Supts., Mr. and Mrs. A. Spicer.

WARWICKSHIRE.

Agatha Stacey Home, Rednal, near Birmingham.—40 females. The Managers, 158, Broad St., Birmingham. (Class A.)

Colehill Hall, near Birmingham.—For both sexes. Med. Supt., Dr. H. F. Stephons. (Class A.)

Great Barr Park Colony, Great Barr, near Birmingham.—For both sexes. Med. Supt., Dr. D. M. Macnullan. (Class A.)

Midland Counties Institution, Knowle, near Birmingham.—180 males. Supt., S. H. Thornton. Med. Officer, J. O. Hollick, M.B. (Class A.)

Monyhull Colony, Monyhull Hall Road, King's Heath, Birmingham.—For both sexes. Med. Supt., Dr. A. M. McCutcheon. (Class A.)

Warwick State Institution, The Cape, Warwick.—Females only. Supt., Miss E. B. Bagley. (Class A.)

Warwickshire Weston Colony, Weston-under-Weatherley, near Leamington Spa.—For both sexes. Supt., A. B. Lane. (Class A.)

WILTS.

Devizes Poor Law Institution.—17 females, 32 males. Managers, Devizes Area Guardians Committee. (Class B.)

Poor Law Institution, Semington, near Trowbridge. 22 males, 36 females. Managers, Trowbridge Area Guardians Committee. Supt., C. H. Taylor. (Class B.)

WORCESTERSHIRE.

Beasford Court Catholic Mental Welfare Hospital for Children, Beasford, near Defford.—For 200 seniors, 120 juniors. Res. Manager, The Right Rev. Monsignor T. A. Newsome. (Class A.)

YORKSHIRE.

The Kepstern Institution, Kirkstall, Leeds.—40 adult females. Managers, Leeds City Council. Executive Officer, Mr. S. Wornald, 38, Park Square, Leeds. Matron, Miss A. Riley. (Class A.)

Meanwood Park Colony, Meanwood, Leeds. 160 males, 268 females. Managers, Leeds City Council. Executive Officer, Mr. S. Wornald, 38, Park Square, Leeds. Matron, Miss C. Surtees Wilson. (Class A.)

Mid-Yorkshire Institution, Whizley, York.—214 males. Managers, The Mid-Yorkshire Joint Board. Supt., Capt. J. Brown, I.S.O. (Class A.)

INSTITUTIONS AND HOMES FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879-1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an 'Inebriate' within the meaning of the Acts.

*NOTE—Ecclesfield, Ashford, is a Roman Catholic Religious Institution.

MALES ONLY.

Nuneaton (Warw.).—*Caldecote Hall* (C.E.T.S. Institution). Res. Med. Supt., Alfred E. Carver, M.D. Nuneaton, 2½ miles. *See also Advt., p. 77*

Rickmansworth (Herts.).—*Dalrymple House*. Apply to Res. Med. Supt., Dr. F. S. D. Hogg. Rickmansworth station, Joint G.C. & Metropolitan Rlwy., ½ mile; L.M. & S.R., 1 mile. *See also Advt., p. 76*

FEMALES ONLY.

Ashford (Middlesex).*—*Ecclesfield*. Med. Supt., Dr. J. Scott. Apply, Mother Superior. Ashford station, 1 mile.

Belfast.—*The Lodge Retreat*, Dundela Avenue, Holywood Road. Med. Attend., Muriel Price, M.D. Matron, Miss R. Clarke. Stations 20-30 minutes by tram.

Thorpe, near Chertsey.—*Spelthorne St. Mary*. Apply to the Sister Superior, C.S.M.V. Med. Supt., Dr. W. Dale.

UNLICENSED HOMES.

Chislehurst (Kent).—*Old Hill House Ltd.* Res. Med. Supt., Walter E. Masters, M.D., M.R.C.S., D.P.H. Chislehurst station, 4 minutes.

Paignton (Devon).—*Bay Mount*, small private home for both sexes. Res. Med. Supt., Dr. Stanford Park.

Woodbridge (Suffolk).—*Norwood Sanatorium Ltd.*, Rendlesham Hall, Woodbridge. Wickham Market station. Telephone and Telegrams: Wickham Market 16. *See also Advt., p. 76*

SANATORIA FOR CONSUMPTION
AND OTHER FORMS OF TUBERCULOSIS.

Aberchelder (N.B.).—*Inverness-shire Sanatorium, Invergarry*. Med. Supt., J. Kirton, M.C., M.A., M.D. Aberchelder, 2 miles.

Abergele (Denbighshire).—*Abergele Sanatorium*. Med. Supt., Dr. J. E. Geddes.

Ascot.—*Farmwood Sanatorium* (for both sexes). Res. Med. Supt., T. H. Hay, M.B., C.M., F.R.C.S.I. Apply, Secretary. Ascot, 1 mile.

Ashford (Kent).—*Grosvenor Sanatorium*, Ashford. Res. Med. Supt., J. A. Milne, M.B., Ch.B., D.P.H. Ashford Junction, 2 miles.

Aysgarth (Yorks).—*Wensleydale Sanatorium*. Physicians, D. Dunbar, M.B., B.S., and W. N. Pickles, M.D., B.S. Aysgarth, ½ mile, via Northallerton, L. & N.E.R., and Hawes Junction, L.M. & S.R. *See also Advt., p. 88*

Baguley (Cheshire).—*Baguley Sanatorium*. For Manchester cases. Res. Med. Supt., H. G. Trayer, M.B., D.P.H. Baguley, 1½ miles.

Barrasford (Northumberland).—*The Newcastle-on-Tyne Sanatorium*. Res. Med. Supt., Dr. C. G. R. Goodwin. Barrasford, L. & N.E.R., 4 miles.

Benenden (Kent).—*Sanatorium of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis."* Res. Med. Supt., Dr. H. Spurrier. Bidenden, 3 miles.

Bingley (Yorks).—*Eldwick Sanatorium* (West Riding County Council school for phthisical children). Med. Off., Dr. Margaret S. Sharp. Bingley station, 2 miles.

Birmingham.—*City Sanatorium*, Yardley Green Road, Smallheath. Res. Med. Supt., Dr. G. B. Dixon. Stechford, L.M. & S.R.

Romsley Hill Sanatorium, Halesowen, Worcestershire. Res. Med. Supt., Dr. P. J. Bodington. Birmingham Corporation Sanatorium. Halesowen, 4½ miles.

Bolton (Lancs.).—*Wilkinson Sanatorium for Consumptives*, Sharples. Med. Off., Dr. W. Rolland. Bolton, 2 miles.

Boston (Lincs.).—*Holland Sanatorium*. Med. Supt., H. C. Jennings, M.B., D.P.H. Boston, 1 mile.

Bournemouth.—*Royal National Sanatorium for Consumption and Diseases of Chest*. Sec., A. G. A. Major. Res. Med. Off., D. A. Hutcheson, M.D. Bournemouth Central, 1½ miles; Bournemouth West, ½ mile.

The Fire Home (for advanced cases of consumption). Hon. Sec., Col. R. F. Anderson. Hon. Treas., A. J. Drewe, Esq. Hon. Med. Offs., C. P. Woodstock, M.D., and S. G. Champaign, M.D. Lady Supt., Miss Ingram. Bournemouth Central, $\frac{1}{2}$ mile.

Bovey Tracey (Devon).—*Devon County Sanatorium*, Hawkmoor. Res. Med. Supt., Dr. J. C. Smyth. Bovey, 3 miles; Lustleigh, 2 miles.

Bradford.—*Bierley Hall Sanatorium*, Bierley Lane. For 60 men and women. Res. Med. Supt., Dr. J. W. Starkey. Bradford, 3 miles.

Braintree (Essex).—*Black Noiley Sanatorium*. Res. Med. Supt., Dr. M. C. Wilkinson. Sec., Clerk of County Council, Shire Hall, Chelmsford.

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland*. Hon. Treas., Lord MacLay, 21, Bothwell Street, Glasgow. Res. Med. Supt., E. J. Peill, M.B., Ch.B., F.R.C.S.E. Bridge of Weir, 2 miles.

Brighton.—*Municipal Sanatorium*, for Brighton townfolk only (pulmonary and joints). Med. Supt., Dr. Duncan Forbes, M.O.H., Royal York Buildings, Brighton. Brighton Central station, $1\frac{1}{2}$ miles.

Bristol.—*Frenchay Park Sanatorium for Bristol Children*, Frenchay, near Bristol. Res. Med. Supt., Dr. K. H. Pridie. Under the control of the M.O.H. Dept., Bristol Staple Hill station, L.M. & S.R., $1\frac{1}{2}$ miles.

Buttevant (Co. Cork).—*Cork County and City Sanatorium*, Heatherside. Res. Med. Supt., Dr. R. Ahern. Buttevant, G.S. & W.R., 6 miles.

Camberley (Surrey).—*Prior Place Sanatorium*, Heatherside. Res. Med. Supt., Dr. H. O. Blanford.

Camborne (Cornwall).—*Tehidy Sanatorium*. Res. Med. Supt., Dr. F. Chown. Camborne, 3 miles.

Cambridge.—*Papworth Village Settlement*. Med. Director, Sir Pendrill Varrier-Jones, M.A., M.R.C.P. Huntingdon station, 6 miles; Cambridge, 12 miles.

Chagford (Devon).—*Dartmoor Convalescent Home*. Res. Med. Supt., Dr. C. H. Berry. Moretonhampstead, G.W.R., 6 miles.

Chandler's Ford (Hants).—*Hants County Council Sanatorium*. Res. Med. Supt., Dr. W. J. Hart. Chandler's Ford, 1 mile.

Cheltenham.—*The Cotswold Sanatorium*, Cranham, Gloucester. Res. Med. Phys., Geoffrey A. Hoffman, B.A., M.B., T.C. (Dub.), and Margaret A. Harrison, M.B., B.S. (Lond.). Cheltenham, Gloucester, or Stroud, all 8 miles. See also *Advt.*, p. 82

Salterley Grange Sanatorium, near Cheltenham. Res. Med. Supt., Dr. D. J. Peebles. Leckhampton, $2\frac{1}{2}$ miles; Cheltenham, $3\frac{1}{2}$ miles.

Conway, North Wales.—*The Dr. Garrett Memorial Home*, Morfa Drive. For boys and girls. 200 beds (86 open-air). Proprietress, Mrs. C. E. M. Garrett. Conway, L.M. & S.R., $\frac{1}{2}$ mile.

Dagenham (Essex).—*West Ham Sanatorium*, for adults; *Langdon Hills Sanatorium*, Laindon, Essex, for children. Med. Supt., Dr. G. M. Mayberry.

Darlington.—*Felix House*, Middleton St. George, Co. Durham. Res. Med. Supt., C. S. Steavenson, M.B. Dinsdale, N.E.R., 3 minutes.

Davos-Platz (Switzerland).—*Park Sanatorium* (formerly *Sanatorium Turban*), Davos-Platz. Res. Med. Supt., F. Bauer, M.D. Davos-Platz, 10 minutes.

See also *Advt.*, p. 86
Sanatorium Schatzalp, Davos-Platz. Res. Med. Supt., Edward C. Neumann, M.D. Davos-Platz station and Schatzalp funicular. See also *Advt.*, p. 80

"*The Victoria*" *British Sanatorium*, Davos (Grisons). Res. Med. Supt., Bernard Hudson, M.D., M.R.C.P.

See also *Advt.*, p. xlii

Derbyshire.—*Derbyshire County Sanatorium*, Walton, near Chesterfield. Med. Supt., A. N. Robertson, M.D. Chesterfield, $1\frac{1}{2}$ miles.

Devon and Cornwall Sanatorium, Didworthy, South Brent. For consumptives of the two counties. Sec., S. Carlile Davis, Esq., M.B.E., 5, Princess Square, Plymouth. Res. Med. Off., Dr. A. T. Bettinson. Brent, G.W.R., 2 miles.

Dublin.—*Peamount Sanatorium*, New-castle, Co. Dublin. Res. Med. Supt., A. Barry, F.R.C.P.I. Lucan, 2 miles.

Dundee (near).—*Sidlaw Sanatorium*, Auchterhouse. 80 beds for children. (In connection with Dundee Royal Infirmary. Med. Supt., H. J. C. Gibson, M.D.). Vis. Phys., W. E. Foggie, D.S.O., M.D. Vis. Surg., L. T. Price, F.R.C.S.E. Matron, Miss Ellen Norris. Sec., W. F. Ferguson. Auchterhouse station, $1\frac{1}{2}$ miles.

Durham.—*Durham County Consumption Sanatoria*. Sec., Mr. F. Forrest, 54, John Street, Sunderland. Vis. Med. Supt., Dr. G. S. Robinson. For men and boys: *Horn Hall*, Stanhope. Med. Off., Dr. J. O'Hara. Stanhope station, 1 mile. For women and children: *The Leazes House*, Wolsingham. Med. Off., Dr. J. F. McConchie. Wolsingham station, $\frac{1}{2}$ mile.

East Fortune (East Lothian).—*East Fortune Sanatorium*. Res. Med. Supt., Chas. Cameron, M.D. East Fortune, $\frac{1}{2}$ mile.

Ecclefechan, by Lockerbie.—*St. Fechan's Sanatorium*, for boys. Res. Med. Off., Dr. F. A. Collington. Ecclefechan station, 1 mile.

Fortbreda, Belfast.—*Forster Green Hospital for Consumption and Chest Diseases*. Med. Supt., B. R. Clarke, M.D. Sec., J. Osborne, 99-103, Scottish Provident Buildings, Belfast. Belfast, 2 miles.

Frimley (Surrey).—*Brompton Hospital Sanatorium*. Res. Med. Supt., Dr. R. C. Wingfield. Frimley station, 2 miles.

Burrow Hill Sanatorium Colony, St. Catherine's Road, Frimley, Surrey. For youths between 14 and 19 years. Res. Med. Supt., Dr. A. H. Macpherson.

Grange-over-Sands.—*Westmorland Sanatorium*, Meathop. Res. Med. Supt., J. Munro Campbell, M.B., Ch.B., D.P.H. Grange-over-Sands station, 2 miles.

Gt. Barrow, Chester.—*East Lancashire Tuberculosis Colony and Sanatorium, Barrowmore Hall*. Occupational treatment. Res. Med. Supt., Dr. E. L. Sandilands. Chester, 6 miles.

Harpenden (Herts). *Sanatorium of the National Children's Home and Orphanage*. Harpenden station, L.M. & S.R. Vis. Phys., T. N. Kelynack, M.D., J.P. and A. V. Kelynack, M.R.C.S., L.R.C.P. Principal, Rev. W. Hodson Smith, Highbury Park, London, N.5. See also *Advt.*, p. 83.

Hastings.—*Fairlight Sanatorium*, in connection with Margaret Street Hospital for Consumption (for Out-Patients), 26, Margaret St., W. Sec., Mrs. M. C. Hawthorne. Med. Off., Dr. N. F. Stallard. Hastings, tram, about 15 minutes.

Heswall (Cheshire).—*Cleaver Sanatorium for Children*. 200 beds. Med. Supt., J. B. Yeoman, M.D. Matron, Miss D. Kelsall. Heswall, $\frac{1}{2}$ miles.

Hexham (Northumberland).—*Wooley Sanatorium*. Res. Med. Supt., Dr. R. Cunningham. Corbridge, 5 miles.

Huntingdon.—*Wytton Sanatorium* (Hunts County Council), for women and children. Med. Off., Dr. Moss-Blundell. Huntingdon, $\frac{3}{4}$ miles.

Ilkley (Yorks).—*Middleton Sanatorium*, near Ilkley. Res. Med. Supt., T. Campbell, M.D. Ben Rhydding, $\frac{1}{4}$ miles.

Isle of Wight.—*Hermilage Sanatorium*, Whitwell, near Ventnor. For males only. Med. Supt., Dr. H. F. Bassano.

Royal National Hospital for Consumption, Ventnor. Med. Supt., Dr. G. Oliver Hempton. Sec., H. R. Rowe, 18, Buckingham St., Strand, W.C.2. Ventnor, 1 mile. See also *Advt.*, p. 83.

Kingussie (Inverness-shire).—*Grampian Sanatorium*. Res. Med. Supt., Felix Savy, M.D. Kingussie, $\frac{1}{2}$ mile. See also *Advt.*, p. 84.

Kirkcaldy.—*Sanatorium for Tuberculosis*. Med. Supt., Dr. G. W. McIntosh. Res. Med. Off., Dr. James L. Smith. Sec., The Town Clerk. Kirkcaldy, 1 mile.

Leeds.—*Gateforth Sanatorium*, near Selby. Res. Med. Supt., Dr. A. C. Meek. *Leeds Sanatorium for Consumptives*, Killingbeck; and *Children's Sanatorium*, "The Hollies," Westwood, Leeds.

Liverpool.—*Broadgreen Sanatorium*, Edge Lane Drive, Liverpool. Res. Med. Supt., Dr. O. F. Thomas. Broadgreen station, $\frac{1}{2}$ mile.

Fazakerley Sanatorium, Longmoor Lane, Liverpool. Res. Med. Supt., C. Rundle, O.B.E., M.D. Fazakerley station, $\frac{1}{2}$ mile.

Liverpool Sanatorium for Consumptives, Delamere Forest, Frodsham. Sec., W. H. Rayner, Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Alfred Adams, M.D., D.P.H. Frodsham or Helsby, L.M. & S.R., $\frac{3}{4}$ miles.

Llanybyther (Carmarthenshire).—*West Wales Sanatorium*. The Welsh National Memorial to King Edward VII. Res. Med. Supt., Dr. Henry A. Ross. Llanybyther station, 3 miles.

London.—*City of London Hospital for Diseases of the Heart and Lungs*, Victoria Park, E.2. Apply, Secretary.

Royal Chest Hospital, 231, City Road, E.C.1 (Section of the Royal Northern Group of Hospitals). Apply, Secretary.

Manchester.—*Manchester Hospital for Consumption and Diseases of Throat and Chest*, Hardman Street, Deansgate, Manchester (Out-patients). Sec., W. Hunt. *St. Anne's Home*, Bowdon, Cheshire (In-patients). Res. Med. Off., Dr. J. C. Connacher. *Crossley Sanatorium*, Delamere, Cheshire. Res. Med. Off., Dr. G. Heathcote. (For poor and working classes, after personal examination at Manchester.)

Market Drayton (Shropshire).—*Cheshire Joint Sanatorium*. Res. Med. Supt., Dr. Peter W. Edwards. Market Drayton, $\frac{4}{5}$ miles.

Marple (Cheshire).—*Nab Top Sanatorium*, for residents of Salford only. Med. Supt., H. M. Fleming, M.D. Rosehill (Marple) station, $\frac{1}{2}$ mile.

Menai Bridge, Anglesey.—*Penrhosgyn-y-Gors Sanatorium for Children* (King Edward VII Welsh National Memorial Association). Med. Off., Dr. Emrys Jones. Matron, A. Jones. Menai Bridge, 3 miles.

Mendip Hills.—*Nordrach-upon-Mendip*, Blagdon, near Bristol. Res. Med. Supt., Cyril Francis Ashby, M.R.C.S., L.R.C.P. Sandford and Banwell station, G.W.R.

See also *Advt.*, p. 86.

Midhurst (Sussex).—*King Edward VII Sanatorium*. Res. Med. Supt., Dr. R. R. Trail. Midhurst, 4 miles.

Milford (Surrey).—*Surrey County Sanatorium.* Res. Med. Supt., Dr. R. J. Allison.

Montana-sur-Sierre (Switzerland).—*Montana Hall (The British Sanatorium).* Res. Med. Supt., Hilary Roche, M.D., M.R.C.P. See also Advt., p. 81

Murtle (Aberdeenshire).—*Tor-na-Dee Sanatorium.* Res. Med. Supt., Dr. J. M. Johnston. Murtle, $\frac{1}{2}$ mile. See also Advt., p. 84

Nayland (Suffolk).—*East Anglian Sanatorium* for private patients, *Malings Farm Sanatorium* for poorer men and women patients, and *East Anglian Children's Sanatorium.* Nayland. Med. Supt., Dr. Jane Walker, C.H., J.P., LL.D. Bures station, L. & N.E.R., $3\frac{1}{2}$ miles; Colchester, 8 miles. See also Advt., p. 82

New Cumnock (Ayrshire).—*Ayrshire Sanatorium.* Glenafton. Res. Med. Supt., E. E. Prest, M.D. New Cumnock, 3 miles.

Norfolk.—*Children's Sanatorium for the Treatment of Phthisis, Incorporated.* Holt. Vis. Med. Off., Dr. H. F. Skrimshire. Hon. Sec., Mrs. C. Munro, Carnegie House, 117, Piccadilly, W.1.

Kelling Sanatorium. Holt. Res. Med. Supt., Dr. J. I. W. Morris. Holt, $1\frac{1}{2}$ miles.

Mundesley Sanatorium. Mundesley. Res. Med. Supts., S. Vero Pearson, M.D., Andrew J. Morland, M.D., and E. C. Wynne-Edwards, M.B. Mundesley, 1 mile. See also Advt., p. 85

Northampton.—*Creaton Sanatorium.* Creaton. Res. Med. Supt., E. T. W. Starkie, B.A., M.R.C.S., L.R.C.P. Brixworth, L.M. & S.R., 3 miles.

Nottinghamshire.—*Ransom Sanatorium* (Notts County Council), Rainworth, near Mansfield. Res. Med. Off., Dr. C. C. Crawford Crowe. Mansfield, 3 miles.

Oban (Scotland).—*Argyll County Sanatorium.* Benvoulin. 40 beds. Vis. Med. Off., Duncan MacDonald, M.D. Oban, 1 mile.

Oldham.—*Strinsedale Sanatorium.* Med. Supt., Dr. J. B. Wilkinson. Oldham, 2 miles.

Pau (Basses-Pyrenees), France.—*Trespoy.* Clinic for Pulmonary Diseases. Med. Director, Dr. W. Julhen. See also Advt., p. 87

Peebles.—*Manor Valley Sanatorium.* Med. Off., C. B. Gunn, M.D. Peebles, 4 miles; Lyne, $1\frac{1}{2}$ miles.

Penmaenmawr (N. Wales).—*Pendyffryn Hall Sanatorium.* Res. Phys., Dennison Pickering, M.D. (Camb.), and E. Firth, M.B., Ch.B. Penmaenmawr, L.M. & S.R., $1\frac{1}{2}$ miles. See also Advt., p. 85

Peppard Common (Oxon).—*Berks and Bucks Joint Sanatorium.* Res. Med. Off., Dr. Esther Carling. Reading, $6\frac{1}{2}$ miles.

Ringwood (Hants).—*Linford Sanatorium.* Res. Med. Supts., A. de W. Snowden, M.D., Dr. A. G. E. Wilcock, and Dr. C. Cassidy. Ringwood, 3 miles.

See also Advt., p. 82

Robertsbridge (Sussex).—*Darvell Hall Sanatorium* (East Sussex County Council). Res. Med. Off., Dr. J. R. Dingley. Robertsbridge, S. Rly., $\frac{1}{2}$ mile.

Rudgwick (Sussex).—*Rudgwick Sanatorium.* Vis. London Phys., Dr. Annie McCall. Rudgwick station, 7 minutes.

Ruthin (N. Wales).—*Vale of Clwyd Sanatorium, Llanbedr Hall.* Res. Med. Supt., H. Morrison Davies, M.D. Ruthin station, 2 miles.

St. Leonards.—*Eversfield Chest Hospital,* West Hill. Res. Phys., Dr. E. J. Maxwell. West St. Leonards, S.R.; West Marina, S.R., within 5 minutes' walk.

Sandon, near Chelmsford (Essex).—*Mervale Sanatorium.* Res. Med. Supt., H. N. Marrett, M.R.C.S., L.R.C.P. Chelmsford station, L. & N.E.R., $3\frac{1}{2}$ miles.

Sandy (Beds).—*The Bedfordshire County Sanatorium.* Mogerhanger Park. Med. Supt., C. G. Welch, M.D. Sandy station, $2\frac{1}{2}$ miles.

Sheffield.—*The City Sanatoria.* Crimicar Lane Sanatorium (males); Commonsides Sanatorium (females); Winter Street Sanatorium (both sexes); Nether Edge Sanatorium (both sexes and children). Clinical Tuberculosis Off., H. Midgley Turner, M.D., D.P.H. Sheffield, L.M. & S.R., $4\frac{1}{2}$ miles.

Shirlett, near Broseley (Shropshire).—*King Edward VII Memorial Sanatorium.* Res. Med. Supt., Dr. F. T. Turner. Much Wenlock station, 3 miles.

Skipton (Yorks).—*Eastby Sanatorium for Boys.* Res. Med. Supt., Dr. Catherine Arnott. Fimbsay station, 2 miles.

South Mimms, Barnet (Middlesex).—*Clare Hall County Sanatorium.* Med. Supt., A. C. Tabors, M.D. Sec., The Clerk, Guildhall, Westminster, S.W.1.

Stannington (Northumberland).—*Children's Sanatorium.* Res. Med. Supt., Dr. Elsie F. Farquharson, M.A. Matron, Miss J. Campbell. Stannington station, 2 miles.

Stonehouse (Glos).—*Standish House Sanatorium.* Res. Med. Supt., W. A. Dickson, M.D., F.R.C.S. Stonehouse, G.W.R., $1\frac{1}{2}$ miles; L.M. & S.R., $2\frac{1}{2}$ miles.

Stourbridge (Worcs).—*Prestwood Sanatorium.* Med. Supt., Dr. J. Stevenson, M.C. Stourbridge, 3 miles.

Swansea.—*Adelina Patti Tuberculosis Hospital, "Craig-y-nos,"* Pen-y-cae. Res. Med. Supt., Dr. L. R. Clark. Craig-y-nos, 2 miles.

Threlkeld (Cumberland).—*Blencathra Sanatorium*. Res. Med. Supt., Dr. W. Goodchild. Threlkeld, L.M. & S.R., 2 miles. *See also Advt., p. 84*

Torquay.—“*Whitecliff*” *Tuberculosis Hospital*. Med. Supt., Dr. R. H. Robinson. Torre station, 2 miles.

Ulverston.—*High Carley Sanatorium* (including *Oubas House Children's Sanatorium*). Res. Med. Supt., G. Leggat, M.B., Ch.B., D.P.H. Ulverston, 2 miles.

Vence (A.-M.), France.—*Chateau des Fleurs*. All forms of pulmonary affections. Res. Physician. *See also Advt., p. 89*

Ware (Herts).—*Hertfordshire County Sanatorium*, Ware Park. Res. Med. Supt., Herbert Sharpe, M.R.C.S., L.R.C.P. Ware, 2 miles; Hertford, 2 miles.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium*. Phys., Dr. J. A. O'Tierney. Apply Secretary.

Whiteabbey (Co. Antrim).—*Belfast Municipal Sanatorium*. Res. Med. Supt., P. S. Walker, M.D., B.Ch., B.Sc., D.P.H.

Wicklow.—*The Royal National Hospital for Consumption for Ireland*, Newcastle, Wicklow. Res. Med. Off., O. Denys Hanan, M.D. G.S. Rlys. to Newcastle, Co. Wicklow, 3 miles.

Winsley, near Bath.—*Winsley Sanatorium*. Res. Med. Off., Dr. J. D. Macfie. Limpley Stoke station, 1 mile.

Worcester (near).—*King Edward VII Memorial Sanatorium*, Knightwick. Free to County patients. Res. Med. Supt., Dr. H. Gordon-Smith. Knightwick, 1½ miles.

HYDROPATHIC ESTABLISHMENTS.

Bournemouth (Hampshire).—*Bournemouth Hydropathic*. Res. Med. Supt., W. J. Smyth, M.D. Bournemouth West station, ½ mile. *See also Advt., p. 80*

Durley Dean Hydro, Bournemouth. Proprietor, C. K. Harper. Bournemouth West, 1 mile.

Linden Hall Hydro, Bournemouth. Proprietors, The Exton Hotels Co. Ltd.

Bristol.—*The Bristol Hydropathic and Electrotherapeutic Establishment*, College Green. Res. Phys., A. T. Spoor, M.A., M.R.C.S., L.R.C.P. Res. Med. Supt., W. J. Spoor, M.B., M.R.C.S.

Cork.—*St. Ann's Hill Hydropathic*, St. Ann's Hill, near Blarney, Co. Cork. Res. Phys., Dr. R. H. Barter. Blarney North, 3 miles; Blarney South, ½ mile.

Crieff.—*Strathearn Hydro* (17 miles from Perth). Res. Med. Supt., T. Gordon Meikle, M.B., C.M. Crieff station, 1 mile.

Forres.—*Cluny Hill Hydropathic*. Vis. Phys., Dr. John C. Adam. Forres, 1 mile.

Harrogate (Yorkshire).—*Harlow Manor Hydro*. Manageress, Mrs. Baxter. Harrogate station, 1 mile.

The Cairn Hydro, Harrogate. Apply Manager. Harrogate station, ½ mile.

The Harrogate Hydropathic Lim. Med. Supt., Dr. A. Hinsley-Walker. Man., W. Taylor. Harrogate station, ½ mile.

Ilkley (Yorkshire).—*Craiglands Hydro*. Res. Phys., Maurice R. Dobson, O.B.E., M.B., B.S. (Lond.), L.R.C.P., M.R.C.S. (Eng.). *See also Advt., p. 80*

Limpley Stoke (near Bath).—*West of England Hydropathic*. Vis. Med. Supt., Dr. C. N. Vaisey. Apply, the Secretary.

Matlock. *Rockside Hydropathic*, Matlock. Two Vis. Physicians. Matlock, ½ mile. *See also Advt., p. 83*

Smedley's Hydropathic, Matlock. Res. and Vis. Physicians. Matlock station, ½ mile; omnibus. *See also Advt., p. 91*

Peebles.—*Peebles Hotel Hydropathic*. L.M.S. and L. & N.E.R. stations.

Southport (Birkdale Park).—*Smedley Hydropathic*. Southport or Birkdale stations, 5 minutes.

Kenworthy's Hydropathic, Southport. Res. Phys., Dr. I. E. Kenworthy. Chapel Street or Lord Street stations.

West Kirby (Cheshire).—*West Kirby Hydro Hotel*. Telephone: Hoylake 86, Kirby Park station, 5 minutes. Apply Manageress. *See also Advt., p. 89*

NURSING ASSOCIATIONS AND INSTITUTIONS FOR NURSES.

London.—*Cavendish Temperance Male Nurses' Corporation Lim.*, 54, Beaumont St., W.1; 23, Upper Baggot St., Dublin; 28, Windsor Terr., Glasgow; and 176, Oxford Rd., Manchester.

See also Advt., p. 70

Male Nurses' Association, 29, York Street, Baker Street, W.1. Sec., W. J. Hicks. *See also Advt., p. 89*

New Menta: Nurses' Co-operation, 130, Edgware Road, Marble Arch, W.2. Lady Supt., Miss Eva R. Crook.

See also Advt., p. 89

The Nurses' Association, 29 York Street, Baker Street, W.1. Sec., W. J. Hicks; Supt., Mrs. Millicent Hicks.

See also Advt., p. 89

The Temperance Male and Female Trained Nurses' Co-operation, 45, Beaumont Street, W.1. Sec., H. S. Sturgess. See also *Advt.*, p. 73

Torquay.—*Torquay Nurses' Co-operation*. Telephone: Torquay 2000. Apply Supt. See also *Advt.*, p. 71

York.—*The Retreat, Trained Nurses' Department*. Apply to the Matron. See also *Advt.*, p. 73

PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, AND INSTITUTIONS FOR SPECIAL CARE AND TREATMENT.

Alderley Edge (Cheshire).—*The David Lewis Colony* (for sane epileptics), and *Colthurst House School* (for epileptic boys and girls). Res. Director, Alan McDougall, M.D. Alderley Edge, 3 miles.

See also *Advt.*, p. 72

Bath.—*Lansdown Hospital and Nursing Home*, Bath. Special arrangements for patients suffering from gout, rheumatism, and physical infirmities. Physician, Dr. Wells-Beville. L.M. & S. or G.W. stations, 1 mile.

See also *Advt.*, p. 68

Bexhill-on-Sea (Sussex).—*Home for Rest, Convalescence, and Electrotherapy*, 55, Egerton Road, Bexhill. Apply, Miss Rattray, S.R.N., C.S.M.M.G. Bexhill stations, 10-15 minutes.

Bristol.—*Dorset House*, Clifton Down. Functional nervous disorder—ladies and girls. Apply, Elizabeth Casson, M.D., D.P.M.

See also *Advt.*, p. 11

Ewell, near Epsom.—*Ewell Grove Nursing Home*. Nervous, Chronic and Convalescent cases received. Res. Med. Supt., J. G. Garson, M.D. Apply, Mrs. Garson. Ewell E. and Ewell W. stations.

See also *Advt.*, p. 75

Grasse (Alpes-Maritimes), France.—*'Hélios.'* Private Hospital and Heliotherapy Establishment. Med. Director, Dr. Brody.

See also *Advt.*, p. 78

Villa 'La Brise,' 6, Route Napoléon, Grasse. For nervous diseases, anaemia, rest cures, etc. Med. Director, Dr. Brody.

See also *Advt.*, p. 78

Harrow-on-the-Hill.—*Bowden House* (for functional nervous disorders). Med. Supt., Henry L. Wilson, M.B., M.R.C.P. Sudbury Hill, Harrow, L. & N.E.R., 15 mins. walk.

See also *Advt.*, p. 75

Hatch End (Middlesex).—*Oxley Grove Ltd.*, Oxley Grove, Hatch End. For early mental conditions in both sexes. Res. Physician, Hatch End (L.M. & S.R. & Bakerloo), 1 mile.

See also *Advt.*, p. 75

King's Langley (Herts).—*The Archer Nerve Training Colony, Langley Rise, Ltd.* (for functional nervous disorders). Vis. Physicians. Apply, Secretary. King's Langley (L.M. & S.R.), 1 mile.

See also *Advt.*, p. 75

Liverpool.—*Home for Epileptics*, Maghull (for sane epileptics), and *Chilton Home*, certified as a special school for 82 epileptic children. Med. Officer, C. V. H. Nesbit, M.D. Soc., C. E. Grisewood, A.C.A., 20, Exchange Street East, Liverpool.

See also *Advt.*, p. 73

London.—*Caerthillian Maternity Home*, 85 and 87, Fordwych Road, Cricklewood, N.W.2. Matron, Miss E. Wyatt.

See also *Advt.*, p. 89

Institute of Ray-Therapy and Electro-Therapy, 152-154, Camden Road, N.W.1. Hon. Med. Director, William Beaumont, M.R.C.S., L.R.C.P. Hon. Sec., Winifred Beaton, M.A.

See also *Advt.*, p. 70

Swedish Institute and Clinique, 108, Cromwell Road, S.W.7. For Massage, Medical Electricity, and Medical Gymnastics. Gloucester Road (Dist., Met. and Piccadilly Tube), 2 minutes. 'Phone, West 1010.

See also *Advt.*, p. 70

Woodside Hospital, Woodside Avenue, Muswell Hill, N. 10. (St. Luke's Foundation.) For functional nervous disorders. Physician in charge.

See also *Advt.*, p. 79

Perth.—*Gilgal Hospital*. For neuro-pathic and psychopathic disorders. Phys. Supt., W. D. Chambers, M.A., M.D.

See also *Advt.*, p. 75

Ruthin, North Wales.—*Ruthin Castle*. Private Hospital for Internal Diseases. Senior Physician, E. I. Spriggs, M.D., F.R.C.P. Ruthin, $\frac{1}{2}$ mile.

See also *Advt.*, p. 111

Southampton.—*Elmsleigh*, Bassett, Southampton. Early mental conditions. Apply, Res. Phys., T. A. Hawkesworth, M.B.

See also *Advt.*, p. 79

Torquay.—*Ockenden Convalescent Home*, Warren Road. Hon. Med. Off., Eric Catford, M.R.C.S., L.R.C.P. Lady Supt., Miss Glover. Torre and Torquay stations, 1 mile.

See also *Advt.*, p. xiii

Worthing (Sussex).—*Prince Albert Convalescent Home*. For men and women. Med. Off., P. J. Le Riche, M.R.C.S., L.R.C.P. Sec.-Supt., A. C. Evans.

See also *Advt.*, p. 77

PRINCIPAL BRITISH SPAS.

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

THE BRITISH SPA FEDERATION.

Bath (Somerset).—Sheltered from N. and N.E. winds by hills from 600 to 800 feet high; 107 miles from London. Average rainfall 31 inches. Climate mild and equable.

Waters.—The springs are hyperthermal, varying from 104° to 120°.

Therapeutic Indications.—Specially suitable for all rheumatic and gouty conditions, skin diseases of gouty and rheumatic origin, chronic laryngitis and pharyngitis, and mucous colitis and similar conditions.

Baths.—An extensive and thoroughly equipped bathing establishment; including deep baths (500 gallons of natural hot radio-active water), undercurrent douching, douche massage in many forms, and intestinal lavage (Plombières douches), throat sprays and inhalation of the natural radium emanation.

Hotel.—The Pulteney Hotel (*see p. 92*).

Nursing and Baths.—Lansdown Hospital and Nursing Home (*see p. 68*).

Bridge of Allan (Stirlingshire).—422 miles from London. Sheltered from N. and N.E. winds by the Ochil Hills. Average rainfall 37 inches. Climate mild and equable.

Waters.—Natural saline mineral springs (Airthrey).

Therapeutic Indications.—Chronic affections of the liver, stomach, and bowels, in many chest diseases, rheumatism, gout, sciatica, and in some diseases of the skin.

Baths.—Excellent suite of baths.

Buxton (Derbyshire).—1000 to 1200 feet above sea level; 163 miles from London; 23 miles from Manchester. Sheltered from north and east winds. Very bracing air.

Waters.—Simple, highly radio-active, natural temperature 82° F., mainly bicarbonate of calcium and magnesium ingredients. Tasteless, odourless; also chalybeate springs.

Therapeutic Indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, and various nervous diseases, neurasthenia, disorders of digestion, and skin diseases, malaria, mucomembranous colitis, arteriosclerosis, phlebitis, diseases of the throat and air-passages; anæmic conditions, and convalescence from prolonged illness.

Baths.—Establishments, including St. Ann's Well (Pump Room), recently modernized.

Cheltenham (Gloucestershire).—184 feet above sea level; 101 miles from London. Climate soft and mild. Average rainfall 27 inches. Sunshine 1486 hours.

Waters.—Three springs: the Fieldholme or twin saline, containing nearly equal parts of magnesium sulphate and sodium sulphate; the Lansdown or sodium sulphate saline, the chief ingredients of which are sulphate and chloride of sodium; and the Pittville or alkaline saline.

Therapeutic Indications.—The toxic and congestive states associated with liver and stomach disorders, constipation, obesity, glycosuria, and gout.

Baths.—Including douche and massage.

Droitwich Spa (Worcestershire).—150 feet above sea level; 2½ hours by express train from London (Paddington), 19 miles from Birmingham, 7 from Worcester. Rainfall 25 inches. Mean maximum temperature 57° F., mean minimum temperature 43° F.

Waters.—The most powerful saline in the world. The brine is pumped from the triassic formation 200 feet below the ground level at a temperature of about 45° F., and is heated by introducing steam.

Therapeutic Indications.—Chronic muscular and articular rheumatism, arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, some heart disorders, sprains and injuries of tendons, muscles, joints, etc.

Baths.—Reclining, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, brine-pine or Homburg baths, etc.

Hotel.—Worcestershire Brine Baths Hotel (*see p. 95*).

Boarding Establishment.—Ayrshire House (*see p. 95*).

Harrogate (Yorkshire).—450–600 feet above sea level, 203 miles from London. The climate is stimulating and fairly dry—bracing moorland air. Average rainfall 30 inches. Mean temperature 47° F.

Waters.—Celebrated for the medicinal properties of its different mineral waters—sulphurous, chalybeate, alkaline, and saline.

Therapeutic Indications.—Gout and other metabolic disorders, functional liver derangement and early cases of cirrhosis, cholelithiasis and cholecystitis, chronic skin diseases, neuritis and arthritis, mucous colitis, chronic dysentery, constipation, and intestinal toxæmias, anæmia, nervous diseases, hyperpæsis, and the sequelæ of tropical diseases.

Baths.—In the bathing establishments all the latest treatments are given.

Mineral Water.—'Aquaperia' aperient mineral water is bottled at Harrogate by Camwall Ltd. from their own Spring (*see p. 159*).

Leamington Spa (Warwickshire).—195 feet above sea level; 88 miles from London. Equable and mild climate. Average rainfall 25 inches. Mean annual temperature 49°. Westerly winds prevail.

Waters.—Hypertonic saline water; aperient and diuretic.

Therapeutic Indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia, and neuritis, diseases arising from a plethoric condition of the chylipoietic viscera, conditions of increased vascular tension, and chronic interstitial nephritis.

Baths.—Turkish, massage douches, saline, Plombières, paraffin wax, Berthollet, electric, and swimming.

Llandrindod Wells (Radnorshire).—750 feet above sea level. Climate exceedingly bracing, but sheltered from east winds, and with an average rainfall of about 40 inches. About 170 miles distant from London.

Waters.—Saline, sulphur and radium-sulphur, magnesiun, lithia saline, and chalybeate. Slightly aperient and strongly diuretic.

Therapeutic Indications.—Digestive disorders, gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus or any kidney or bladder condition requiring diuresis, and in neurasthenia.

Baths.—Sulphur, immersion, needle, and douche; Aix and Vichy douche and massage; Scotch douche; Nauheim; medicated baths; fango and peat baths; whirlpool and agitation baths; and most electrical treatments.

Hotel.—Ye Wells Hotel (see p. 92).

Strathpeffer Spa (Ross-shire, N.B.).—180 to 300 feet above sea level. Sheltered practically on all sides, except the N.E. Prevailing wind S.W. Bracing air. Average rainfall 31 inches. Mean annual temperature 45° F.

Waters.—Sulphurous and chalybeate. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic Indications.—Chronic gout and rheumatism, rheumatoid arthritis; chronic skin diseases, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, and neurasthenia.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, Plombières, radiant heat (electric), and high-frequency current.

Trefriw Wells (Carnarvonshire).—5 hours from London. The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type. The pump-room and baths are open all the year, but the principal season is March to the end of October.

Waters.—Two varieties: (1) The stronger sulpho-chalybeate, and (2) the milder sulpho-chalybeate. Used internally, and externally in the form of baths.

Therapeutic Indications.—Curable forms of anæmia, nervous, debilitating and wasting diseases, rheumatism, sciatica, gout, and neuritis.

Woodhall Spa (Lincolnshire).—50 feet above sea level. 124 miles from London. Average rainfall 24 inches. Mean annual temperature 48°.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic Indications.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and nose; liver disorders.

Spa Baths.—These include immersion, shower, undercurrent, and local douches; Aix and Vichy douche massage; Nauheim, electric, and Schnee baths; Dowsing radiant heat and light baths.

New Zealand Spas.—Many of the mineral waters of New Zealand are quite unlike any European waters; others are of kinds familiar in Europe, but stronger in mineralization than most Continental waters. The principal spas are:—

ROTORUA.—A first-class, well-equipped spa, with modern bathing establishment and limitless supply of sulphur waters of two main types: alkaline sulphur, containing sodium chloride, bicarbonate, and silicate; and acid sulphur, used for baths only.

Climate and Season.—The spa being 1000 ft. up, the climate is by no means hot. Season from December to May, but baths open all the year round.

TAUPO.—The most elevated spa in New Zealand.

Climate.—Tonic and sedative. The waters are hot salines, with carbonic acid gas; also alkaline and chalybeate.

TE AROHA.—Hot alkaline waters of the Vichy type, but double the strength. There are comfortable baths, but this is essentially a place for drinking the waters, which are unique in their strength of sodium bicarbonate.

Climate.—Mild and sedative.

DUNEDIN.—In the South Island; has mild sulphur baths and a bracing climate.

OTHER BRITISH SPAS.

Church Stretton (Salop).—613 feet above sea level. 153 miles from London. Pure bracing air, and a generally invigorating climate. Prevailing wind, S.W. Average rainfall 33 inches. Mean temperature 44°.

Waters.—Said to be the purest in Great Britain.

Therapeutic Indications.—Specially the 'open-air' cure of neurasthenia, for sequelæ of influenza, for insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from overwork, and convalescence after illness or operation.

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe, 211 miles from London, 18 miles from Harrogate. Occupying a sheltered position. Average rainfall 39 inches. Mean annual temperature 47° F. Bracing and invigorating moorland air.

Waters.—The water-supply obtained from springs is remarkably pure, bright, and sparkling. Chalybeate waters. Saline.

Therapeutic Indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydro-therapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

Hydropathic Establishment.—Craiglands Hydropathic (*see p. 90*).

Llangammarch Wells (Breconshire).—600 feet above sea level. 213 miles from London. Well protected from the east, and prevailing wind is S.W.

Water.—Saline, containing the chlorides of barium (6½ grains per gallon), calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles.

Therapeutic Indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Malvern (Worcestershire).—520 feet above sea level. A health centre of long repute, 122 miles from London. Air dry and bracing. Prevailing winds S.W. and W. Average rainfall 30 inches. Mean temperature about 49° F. Exceptional sunshine records.

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon, with high eliminative qualities. The water is dispensed in a new Pump-Room adjoining the Winter Gardens and Priory Park.

Therapeutic Indications.—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial, nephritic, and cutaneous diseases.

Matlock (Derbyshire).—144 miles from London. South-west aspect—well sheltered from the north and east. Climate free from extremes of heat and cold. The water pure and soft. Season all the year. The Matlock system of hydropathic treatment is carried out in all its branches. The principal Hydros are installed with latest electric baths and appliances.

Therapeutic Indications.—Gout, rheumatism, arthritis, neuritis, sciatica, lumbago, neurasthenia, colitis, cholecystitis, cardiac and renal diseases.

Hydropathic Establishments.—Smedley's Hydropathic (*see p. 91*); Rockside Hydro (*see p. 93*).

At Matlock Bath there is a large swimming bath supplied by thermal mineral springs of long-established repute, rising at 68° F.

Peebles (Peeblesshire, N.B.).—About 500–600 feet above sea level. One hour from Edinburgh and 382 miles from London. Average rainfall, about 38 inches. Bracing climate, but sheltered from the north winds.

Waters.—The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well (6 miles east).

Therapeutic Indications.—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, dyspepsia, gout, rheumatism, and neurasthenia.

Tunbridge Wells (Kent).—400 feet above sea level, 34 miles from London. Climate is tonic and invigorating. Prevailing winds W. and S.W. Average rainfall, about 30 inches. Mean temperature, 49°.

Waters.—A weak, non-aerated, chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic Indications.—Waters indicated in anæmia, chlorosis, and allied conditions.

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Scottish Department of Health. 121A, Princes Street, 12, Shandwick Place, 126, George Street, and 19, Rose Street, Edinburgh. *Secretary of State for Scotland*, Major the Rt. Hon. Sir Godfrey Collins, K.B.E., C.M.G., M.P.; *Under-Secretary of State for Scotland*, A. N. Skelton, M.P.; *Secretary*, John Jeffery, C.B., C.B.E.; *Chief Medical Officer*, J. L. Brownlie, M.D.; *Medical Officers*, Fred Dittmar, M.A., M.D., Charlotte A. Douglas, M.D., J. M. Johnston, M.B., G. R. Leighton, O.B.E., M.D., P. L. McKinlay, M.D., A. Shearer, M.B., Ernest Watt, M.D., D.Sc.

Irish Free State, Department of Local Government and Public Health.—Custom House, Dublin. *Minister*, Seán T. O'Ceallaigh; *Secretary*, E. P. McCarron; *Chief Medical Adviser*, E. F. Stephenson, F.R.C.S.I.; *Medical Inspectors*, A. D. Clinch, M.D., W. S. Berry, M.B., Florence Dillon, L.R.C.P.I., J. D. MacCormack, L.R.C.P.I., J. B. Barrett, M.B. *Bacteriologist*, W. D. O'Kelly.

Medical Research Council.—38, Old Queen Street, Westminster, London, S.W.1. *Secretary*, Sir Walter M. Fletcher, K.B.E., C.B., M.D., Sc.D., F.R.S.

Lunacy Boards.—

ENGLAND AND WALES—Board of Control, Caxton House West, Tothill Street, S.W.1. *Sec.*, P. Barter, Esq.

SCOTLAND—25, Palmerston Place, Edinburgh. *Sec.*, J. A. W. Stone.

IRISH FREE STATE—Custom House, Dublin. *Inspector*, D. L. Kelly, L.R.C.S.I.

NORTHERN IRELAND—Ministry of Home Affairs, Stormont, Belfast.

Chief Medical Officer, Capt. Norman C. Patrick, M.R.C.S.

Lord Chancellor's Visitors in Lunacy.—Royal Courts of Justice, Strand, W.C.2. *Visitors*, H. C. Meysey-Thompson, Barrister-at-Law; Nathan Raw, C.M.G., M.D.; A. Rotherham M.A., M.B.; and the Master in Lunacy (*ex officio*). *Sec.*, H. MacDonald; *Clerk*, W. H. Wade.

Central Midwives Board.—**ENGLAND**: 1, Queen Anne's Gate Buildings, S.W.1. *Chairman*, J. S. Fairbairn, F.R.C.P., F.R.C.S.; *Secretary*, H. G. Westley, M.A., LL.B. **SCOTLAND**: 49, George Square, Edinburgh. *Chairman*, James Haig Ferguson, M.D.; *Secretary*, D. Thomson. **IRISH FREE STATE**: 33, St. Stephen's Green, Dublin. *Chairman*, Sir Edward Coey Bigger, K.B.E., M.D.; *Secretary*, Miss Olive G. Meyer.

MEDICAL SOCIETIES.

- Abernethian Society**—St. Bartholomew's Hospital, E.C.1.
Æsculapian Society—Metropolitan Hospital, Kingsland Road, E.8.
Anatomical Society of Great Britain and Ireland—Secretary, E. Barclay-Smith, M.D., Park Lodge, Hervey Road, Blackheath, S.E.
Association of Clinical Pathologists—Sec., S. C. Dyke, Pathological Laboratories, Royal Hospital, Wolverhampton.
Association of Local Government Medical Officers of England and Wales, Bank Chambers, 150-152, High Street, Stoke Newington, N.16.
Association of Physicians of Great Britain and Ireland—Secretary, H. L. Tidy, M.D., 39, Devonshire Place, W.1.
Association of Public Vaccinators of England and Wales—17, Grange Road, Purley Oaks.
Association of Surgeons of Great Britain and Ireland—Sec., Julian Taylor, O.B.E., M.S., 65, Portland Place, W.1.
Assurance Medical Society—Sec., C. W. Wirgman, M.D., 121, Cannon Street, E.C.4.
British Dental Association—Secretary, 23, Russell Square, W.C.1.
British Homœopathic Association (Incorporated)—43, Russell Square, W.C.1.
British Hospitals Association (Incorp.)—Sec., Central Bureau of Hospital Information, 12, Grosvenor Crescent, S.W.1.
British Institute of Radiology (Incorp. The Röntgen Society)—32, Welbeck Street, W.1.
British Medical Association—Secretary, B.M.A. House, Tavistock Square, W.C.1.
British Medical Protection Society Lim.—22, Langham Street, W.1.
British Optical Association—Sec., Clifford's Inn Hall, E.C.4.
British Orthopædic Association—Sec., E. P. Brockman, F.R.C.S., 73, Harley Street, W.1.
British Pædiatric Association—Sec., D. Paterson, M.D., 27, Devonshire Place, W.1.
British Psychological Society—Sec., R. J. Bartlett, M.Sc., 55, Russell Square, W.C.1.
British Social Hygiene Council—Carteret House, Carteret Street, S.W.1.
Chelsea Clinical Society—Sec., A. Rugg-Gunn, F.R.C.S., 49, Harley Street, W.1.
Clinical Research Association Ltd.—Watergate House, York Buildings, Adelphi, W.C.2. (*See Advertisement, p. 1.*)
Cremation Society (Incorp.)—23, Nottingham Place, W.1.
Epsom College (Royal Medical Foundation)—Sec., 49, Bedford Square, W.C.1.
Guild of St. Luke—Hon. Sec., Andrew Currie, M.D., King's College, Strand, W.C.2.
Guild of SS. Luke, Cosmas and Damian—Sec., W. J. O'Donovan, O.B.E., M.D., 138, Harley Street, W.1.
Harveian Society of London—Sec., R. Covo-Smith, M.A., M.B., B.Ch., 2, Burwood Place, Hyde Park, W.2.
Hunterian Society—Sec., 79, Wimpole Street, W.1.
Imperial Cancer Research Fund—Examination Hall, 8-11, Queen Square, W.C.1.
Infirmary Medical Superintendents' Society—Sec., James I. P. Wilson, M.D., Hackney Hospital, Homerton, E.9.
Institute of Hygiene (Incorp.)—Sec., A. S. Harding, 28, Portland Place, W.1.
Irish Medical Association—Sec., 28, Molesworth Street, Dublin.
Irish Medical Schools and Graduates' Association—Sec., 11, Chandos Street, W.1.
Listerian Society—King's College Hospital, S.E.5.
London and Counties Medical Protection Society Lim.—Sec., C. M. Fegen, Victory House, Leicester Square, W.C.2. (*See Advertisement, p. 51.*)
London Association of the Medical Women's Federation—Sec., Miss A. C. Gillie, M.B., B.S., 86, Porchester Terrace, W.2.
London Cancer Society—Sec., T. Y. Simpson, C.B.E., M.S., 144, Harley Street, W.1.
London Hospital Medical Society—London Hospital, Mile End, E.1.
London Jewish Hospital Medical Society—Sec., Stepney Green, E.1.
Medical Abstiners' Association—Sec., 33, Bedford Place, W.C.1.
Medical Defence Union Lim.—Sec., Dr. James Neal, 49, Bedford Square, W.C.1.
Medical Officers of Schools' Association—Sec., 11, Chandos Street, W.1.
Medical Practitioners' Union—Sec., 56, Russell Square, W.C.1.
Medical Research Society—Sec., R. T. Grant, M.D., Dept. of Clinical Research, University College Hospital Medical School, University Street, W.1.
Medical Sickness, Annuity and Life Assurance Society Lim.—300, High Holborn, W.C.1.
Medical Society for the Study of Venereal Diseases—Sec., 43, Queen Anne Street, W.1.
Medical Society of Individual Psychology—Sec., F. G. Crookshank, M.D., 57A, Wimpole Street, W.1.
Medical Society of London—11, Chandos Street, W.1.
Medical Women's Federation—Sec., Miss M. Rew, 9, Clifford Street, W.1.
Medico-Legal Society—11, Chandos Street, W.1.
Metropolitan Police Surgeons' Association—Hon. Sec., 174A, Boyson Road, S.E.17.
Middlesex Hospital Medical Society—Hon. Sec., Mortimer Street, W.1.
National Association for the Prevention of Tuberculosis—Tavistock House North, Tavistock Square, W.C.1.

- National Medical Union—11, Chandos Street, W.1.
 New Health Society—Sec., 39, Bedford Square, W.C.1.
 Ophthalmological Society of the United Kingdom—1, Wimpole Street, W.1.
 Pathological Society of Great Britain and Ireland—Sec., University of Cambridge.
 Pharmaceutical Society of Great Britain—17, Bloomsbury Square, W.C.1.
 Physiological Society—Sec., H. E. Roaf, M.D., 8, Arkwright Road, N.W.3.
 Research Defence Society—11, Chandos Street, W.1.
 Royal Institute of Public Health—23, Queen Square, W.C.1.
 Royal Medical Benevolent Fund—11, Chandos Street, W.1.
 Royal Medical Society—Hon. Sec., 7, Melbourne Place, Edinburgh.
 Royal Medico-Psychological Association—11, Chandos Street, W.1.
 Royal Sanitary Institute—90, Buckingham Palace Road, S.W.1.
 Royal Society of Medicine—1, Wimpole Street, W.1, incorporated by Royal Charter, 1834, and Supplemental Charter, 1907, and embracing the following Sections:—
 Anaesthetics—Children's Diseases—Clinical—Comparative Medicine—Dermatology—
 Epidemiology and State Medicine—Historical—Laryngology—Medicine—Neurology—
 Obstetrics and Gynaecology—Odontology—Ophthalmology—Orthopaedics—
 Otology—Pathology—Physical Medicine—Psychiatry—Radiology—Surgery (with
 sub-section of Proctology)—Therapeutics and Pharmacology—Tropical Diseases
 and Parasitology—United Services—Urology.
 Royal Society of Tropical Medicine and Hygiene—Manson House, 26, Portland Place, W.1.
 St. John's Hospital Dermatological Society (incorporating the London Dermatological
 Society)—49, Leicester Square, W.C.2.
 St. Thomas's Hospital Medical and Physical Society—St. Thomas's Hospital, S.E.1.
 Society for the Prevention of Venereal Disease—Sec., 6, Holborn Viaduct, E.C.4.
 Society for the Relief of Widows and Orphans of Medical Men—11, Chandos Street, W.1.
 Society for the Study of Inebriety—Hon. Sec., 19, Park Crescent, Portland Place, W.1.
 Society of Medical Officers of Health—1, Upper Montague Street, W.C.1.
 Tuberculosis Association—Hon. Sec., G. T. Herbert, St. Thomas's Hospital, S.E.1.
 Wellcome Historical Medical Museum—Wellcome Research Institution, 173-193,
 Euston Road, N.W.1.
 West Kent Medico-Chirurgical Society—Hon. Sec., Dr. C. J. B. Buchan, "Ledard",
 267, Baring Road, S.E.12.
 West London Medico-Chirurgical Society—West London Hospital, Hammersmith, W.6.

MEDICAL AND SCIENTIFIC PERIODICALS, ETC.

- Anæsthesia, British Journal of—Quarterly, 10/6—34, Cross Street, Manchester.
 Analyst—Monthly, 3/-; 30/- per annum—W. Heffer & Sons Ltd., Cambridge.
 Anatomy, Journal of—Quarterly, 40/- per annum—Cambridge University Press, Fetter
 Lane, E.C.4.
 Annals of Applied Biology—Occasionally, 12/-—Cambridge University Press, Fetter
 Lane, E.C.4.
 Annals of Internal Medicine—Monthly, 44/- per annum—8, Henrietta Street, W.C.2.
 Annals of Surgery—Monthly 4/6—Cassell & Co. Ltd., La Belle Sauvage, E.C.4.
 Archives of Medical Hydrology—Thrice yearly, at 4/- each—109, Kingsway, W.C.2.
 Bacteriology, Journal of—Monthly 5/6, or 55/- per vol.—8, Henrietta Street, W.C.2.
 Better Health—Monthly, 2/6 per annum—36-38, Whitefriars Street, E.C.4.
 Biochemical Journal—Occasionally, 70/- per volume—Cambridge University Press,
 Fetter Lane, E.C.4.
 Biological Chemistry, Journal of—Monthly, 30/6 per volume—8, Henrietta St., W.C.2.
 Biology, Quarterly Review of—30/6 per annum—8, Henrietta Street, W.C.2.
 Birmingham Medical Review—Quarterly, 3/-; 12/6 per annum—The Birmingham
 Medical Institute, 154, Great Charles St., Birmingham. (See Advertisement, p. 50).
 Brain—Quarterly 6/-; 24/- per annum—Macmillan, St. Martin's Street, W.C.2.
 Bristol Medico-Chirurgical Journal—Quarterly 3/-; 10/6 per annum—J. W. Arrow-
 smith Ltd., Bristol. (See Advertisement, p. 48.)
 British Food Journal and Hygienic Review—Monthly 9d.; 10/6 per annum—22,
 Northumberland Avenue, W.C.2.
 British Journal of Experimental Pathology—Six times per annum for 40/-—Lewis,
 28, Gower Place, W.C.1.
 British Journal of Physical Medicine—Monthly, 21/- per annum—17, Featherstone
 Buildings, W.C.1. (See Advertisement, p. 25.)
 British Medical Journal—Weekly 1/3—B.M.A. House, Tavistock Square, W.C.1.
 Caledonian Medical Journal—Quarterly 1/6—70, Mitchell Street, Glasgow, C.1.
 Cancer, Journal of—Quarterly 2/6; 10/6 per annum—Crow Street, Dublin.
 Charing Cross Hospital Gazette—Quarterly, 2/6 per annum—Charing Cross Hospital,
 Chandos Street, W.C.2.

- Childhood, Archives of Disease in—Six times a year, 25/- per annum—British Medical Association, B.M.A. House, Tavistock Square, W.C.1.
- Children's Diseases, British Journal of—Quarterly 7/6; 25/- per annum—Adlard & Son Ltd., 21, Hart Street, W.C.1.
- Clinical Journal—Monthly 2/6; 25/- per annum—Lewis, 136, Gower Street, W.C.1. (*See Advertisement, p. 34.*)
- Dental Journal, British—1st and 15th, 1/-; 25/- per annum—23, Russell Square, W.C.1.
- Dental Record—Monthly 1/-; Brook House, Great Portland Street, W.1.
- Dental Review, British—Monthly—71-72, Wellington Street, S.E.18.
- Dental Science and Prosthetics, British Journal of—Monthly 1/-; 10/- per annum—Bale, 83-91, Great Titchfield Street, W.1.
- Dental Surgeon—Weekly 2d.; 13/- per annum—Baillière, 8, Henrietta Street, W.C.2.
- Dentists' Register—Yearly 12/-—Constable, 10, Orange Street, W.C.2.
- Dermatology and Syphilis, British Journal of—Monthly 4/-; 42/- per annum—H. K. Lewis & Co. Ltd., 28, Gower Place, W.C.1.
- Edinburgh Medical Journal—Monthly 4/- not; 40/- per annum—Oliver & Boyd, Tweeddale Court, Edinburgh.
- General Practice and Franco-British Medical Review—Monthly 1/-—83-91, Great Titchfield Street, W.1.
- Glasgow Medical Journal—Monthly 3/-; 30/- per annum—70, Mitchell Street, Glasgow.
- Guy's Hospital Gazette—Fortnightly 9d., 10/- per annum—Ash & Co. Ltd., Henry Street, Bermondsey Street, S.E.1.
- Guy's Hospital Reports—Quarterly, 12/6—Guy's Hospital, London, S.E.1.
- Heart: A Journal for the Study of the Circulation—Quarterly, 37/6 per annum—Shaw & Sons Ltd., 7, Fetter Lane, E.C.4.
- Helminthology, Journal of—Quarterly, 25/- vol.—Keppel Street, W.C.1.
- Homœopathic Journal, British—Quarterly 5/-—83-91, Great Titchfield Street, W.1.
- Homœopathic World—Monthly 9d.; 7/- per annum—12A, Warwick Lane, E.C.4.
- Hospital, The—Monthly 6d.; 7/6 per annum—34, Paternoster Row, E.C.4.
- Hospitals Year Book—Yearly 10/- not—Central Bureau of Hospital Information, 12, Grosvenor Crescent, S.W.1. (*See Advertisement, p. 46*)
- Hygiene, Bulletin of—Monthly 2/6—Keppel Street, W.C.1.
- Hygiene, Journal of—Quarterly 14/-—Cambridge University Press, Fetter Lane, E.C.4.
- Indian Medical Gazette—Monthly, Rs. 19.8 per annum—Thacker, 2, Creed Lane, E.C.4.
- Inebriety, British Journal of—Quarterly 2/6—Baillière, 8, Henrietta Street, W.C.2.
- Irish Journal of Medical Science (Official Organ of the Royal Academy of Medicine in Ireland)—Monthly 2/6—Parkgate Printing Works, Dublin. (*See Advt., p. 42.*)
- Irish Medical and Hospital World—Monthly, 7/6 per annum—268, North Circular Road, Dublin.
- Journal of Aviation Medicine—Monthly 8/6—8, Henrietta Street, W.C.2.
- Journal of Clinical Pathology—Six times a year for 30/6—8, Henrietta Street, W.C.2.
- Journal of Clinical Research—Quarterly 1/-—Watergate House, York Buildings, Adelphi, W.C.2. (*See Advertisement, p. 1.*)
- Journal of Comparative Psychology—Twice monthly, 5/9—8, Henrietta Street, W.C.2.
- Journal of Experimental Biology—Occasionally, 12/6—133-137, Fetter Lane, E.C.4.
- Journal of Immunology—Twice monthly, 5/9—8, Henrietta Street, W.C.2.
- Journal of Nutrition—Six times yearly, 27/6 per annum—8, Henrietta Street, W.C.2.
- Lancet—Weekly, 42/- per annum—7, Adam Street, W.C.2. (*See Advertisement, p. 41.*)
- Laryngology and Otology, Journal of—Monthly 4/-; 40/- per annum—Headley Brothers, 109, Kingsway, W.C.2. (*See Advertisement, p. 20.*)
- Laryngoscope, The—Monthly, 35/- per annum—Baillière, 8, Henrietta Street, W.C.2.
- Liverpool Medico-Chirurgical Journal—Twice yearly, 2/6—Mount Pleasant, Liverpool.
- London Hospital Gazette—Eight times a year, 1/-—London Hospital Club's Union, Turner Street, E.1.
- Magazine of the London (Royal Free Hospital) School of Medicine for Women—Three times yearly, 2/6 per annum—Women's Printing Society, Brick Street, W.1.
- Massage and Medical Gymnastics, Journal of the Chartered Society of—Monthly 6d.—Tavistock House North, Tavistock Square, W.C.1.
- Masseuses and Masseurs, Register of—Yearly 4/-—Tavistock House North, W.C.1.
- Maternity and Child Welfare—Monthly 1/-; 10/6 per annum—Bale, 83-91, Great Titchfield Street, W.1.
- Medical Annual—Yearly 20/- not—John Wright & Sons Ltd., Bristol.
- Medical Directory—Yearly 36/- not—Churchill, 40, Gloucester Place, W.1. (*See Advertisement, p. 30.*)
- Medical Forum—Monthly 2/-; 21/- per annum—83-91, Great Titchfield Street, W.1. (*See Advertisement, p. 21.*)
- Medical Officer—Weekly 1/-; 42/- per annum (and Supplement monthly: The Jennerian)—38-38, Whitefriars Street, E.C.4. (*See Advertisement, p. 40.*)
- Medical Press and Circular—Weekly 6d.; 21/- per annum—8, Henrietta Street, W.C.2. (*See Advertisement, p. 45.*)

- Medical Register—Yearly 21/-—Constable, 10, Orange Street, W.C.2.
 Medical and Dental Students' Register—Yearly 7/6—10, Orange Street, W.C.2.
 Medical Times—Monthly 6d.—8 & 9, St. Alban's Place, Islington, N.1.
 Medical World—Weekly 1/-; 52/- per annum—56, Russell Square, W.C.1.
 Medicine—Quarterly, 30/9 per vol.—8, Henrietta Street, W.C.2.
 Mental Science, Journal of—Quarterly 7/6—40, Gloucester Place, W.1.
 Middlesex Hospital Journal—Six issues, 1/- each—Middlesex Hospital, W.1.
 Midwives' Roll—Yearly 42/-—Spottiswoode, 1, New Street Square, E.C.4.
 National Medical Journal—Quarterly 6d.—National Medical Union, 11, Chandos St., W.1.
 Neurology and Psychiatry, Review of—30/- per annum—Bristol Place, Edinburgh.
 Neurology and Psychopathology, Journal of—Quarterly 8/6 net; 30/- per annum—British Medical Association, Tavistock Square, W.C.1.
 Newcastle Medical Journal—Quarterly, 2/6—Strawberry House, Newcastle-on-Tyne.
 Nutrition Abstracts and Reviews—Quarterly, 21/- per volume—The Reid Library, Rowett Institute, Aberdeen.
 Obstetric Journal—Quarterly, 2/6—8, St. Peter's Square, Manchester.
 Obstetrics and Gynaecology of the British Empire, Journal of—Quarterly 12/-—34, Cross Street, Manchester.
 Occupational Therapy and Rehabilitation—Six issues, 30/6—8, Henrietta Street, W.C.2.
 Ophthalmology, British Journal of—Monthly, 5/-; 42/- per annum—Geo. Pulman & Sons Ltd., 24, Thayer Street, W.1.
 Parasitology—Quarterly 18/6—Cambridge University Press, Fetter Lane, E.C.4.
 Pathology and Bacteriology, Journal of—Six times a year, 60/- per annum—Oliver & Boyd, Edinburgh.
 Pharmacology and Experimental Therapeutics, Journal of—Monthly 7/3—8, Henrietta Street, W.C.2.
 Physical Therapeutics—Monthly 3/3—8, Henrietta Street, W.C.2.
 Physiological Abstracts—Monthly, 42/- per vol.—28, Gower Place, W.C.1.
 Physiology (Experimental), Quarterly Journal of—42/- per annum—Chas. Griffin & Co. Ltd., 42, Drury Lane, W.C.2.
 Physiology, Journal of—Quarterly, 30/- per volume—Fetter Lane, E.C.4.
 Post-Graduate Medical Journal—Monthly 6d.—1, Wimpole Street, W.1.
 Practitioner—Monthly, 4/-; 42/- per annum—6 & 8, Bouverie St., E.C.4. (*See Advertisement, p. 11.*)
 Prescriber—Monthly, 2/-; 20/- per annum—13, Glencairn Crescent, Edinburgh, W. (*See Advertisement, p. 20.*)
 Psycho-analysis, International Journal of—Quarterly, 30/- vol.—8, Henrietta St., W.C.2.
 Psychology, British Journal of—Quarterly (Medical Section), 30/-; (General Section), 30/- net per volume—Cambridge University Press, Fetter Lane, E.C.4.
 Public Health—Monthly 2/6; 31/6 per annum—1, Upper Montague Street, W.C.1.
 Quarterly Journal of Medicine—Quarterly 10/6; 35/- per annum—Oxford University Press, Amen House, E.C.4.
 Radiology, British Journal of—Monthly 4/-; 42/- per annum—The British Institute of Radiology, 32, Welbeck Street, W.1.
 R.A.M.C., Journal of the—Monthly 2/-—Bale, 83-91, Great Titchfield Street, W.1.
 Royal Naval Medical Service, Journal of the—Quarterly 6/- net; 20/- per annum—83-91, Great Titchfield Street, W.1.
 Royal Sanitary Institute, Journal of the—Monthly 1/-—12, Long Acre, W.C.2.
 Royal Society of Medicine, Proceedings of the—Monthly 7/6 net; 105/- per annum—Longmans, Green & Co., 39, Paternoster Row, E.C.4.
 St. Bartholomew's Hospital Journal—Monthly 9d.; 7/6 per annum—Students' Union, St. Bartholomew's Hospital, E.C.1.
 St. Bartholomew's Hospital Reports—Yearly 21/-—50A, Albemarle Street, W.1.
 St. George's Hospital Gazette—Monthly 6d.—83-91, Great Titchfield Street, W.1.
 St. Mary's Hospital Gazette—Monthly, 10/- per annum—58, Porchester Road, W.2.
 St. Thomas's Hospital Gazette—Six times a year, 7/6—St. Thomas's Hospital, S.E.1.
 Serpent, The—Six times a year, 3/6 per annum—University Union, Manchester.
 South African Medical Journal—Fortnightly 1/3; 31/6 per annum—Baillière, 8, Henrietta Street, W.C.2.
 State Medicine, Journal of—Monthly 2/-—23, Queen Square, W.C.1.
 Surgery, British Journal of—Quarterly 12/6 net; 42/- per annum—John Wright & Sons Ltd., Bristol. (*See Advertisement, p. 43.*)
 Surgery, Gynecology and Obstetrics, and International Abstract of Surgery—Monthly 6/9; 60/- per annum—Baillière, 8, Henrietta Street, W.C.2.
 Transactions of the Royal Society of Tropical Medicine and Hygiene—Six times a year for 35/-—Manson House, 26, Portland Place, W.1.
 Tropical Diseases Bulletin—Monthly 2/6; 21/- per annum—Keppel Street, W.C.1.
 Tropical Medicine and Hygiene, Journal of—Fortnightly 1/6; 30/- per annum—Bale, 83-91, Great Titchfield Street, W.1.

Tropical Medicine and Parasitology, Annals of—Quarterly 7/6; 22/6 per annum—University Press, 177, Brownlow Hill, Liverpool.
 Tubercle—Monthly 2/6; 27/6 per annum—Bale, 83-91, Great Titchfield Street, W.1.
 Tuberculosis, British Journal of—Quarterly 2/6—Baillière, 8, Henrietta Street, W.C.2. (See *Advertisement*, p. 44.)
 University College Hospital Magazine—Oct. to March, 6d. each—Bale, 83-91, Great Titchfield Street, W.1.
 Urology, British Journal of—Quarterly, 7/6; 25/- per annum—Constable, 10 & 12, Orange Street, W.C.2. (See *Advertisement*, p. 47.)
 Urology, Journal of—Monthly 4/6—8, Henrietta Street, W.C.2.
 Venereal Diseases, British Journal of—Quarterly, 6/-—10, Orange Street, W.C.2.
 West London Medical Journal—Quarterly 2/-—83-91, Great Titchfield Street, W.1.

SELECTED MEDICAL TRADES DIRECTORY.

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Critchley, J. & Sons, 18, Great George St., Liverpool
 Desoutter Bros. Lim., 73, Baker Street, W.1
 Ferris, J. & E., Lim., 33, Museum Street, W.C.1.
 Haywood, J. H. Lim., Castle Gate, Nottingham
 Masters, M. & Sons Lim., 240, New Kent Rd., S.E.1, 33, Mount Pleasant, Liverpool, and 12, Colston Street, Bristol
 Pache & Son, 6, Smallbrook Street, Birmingham (Eyes)
 Wilson, W. J. & Co. Lim., 45, Bedford Row, W.C.1

Bandages and Antiseptic Dressings.

Grout & Co. Lim., Great Yarmouth and 35, Wood Street, E.C.2
 Robinson & Sons Lim., Chesterfield

Bottle Manufacturers and Merchants.

Beatson, Clark & Co. Lim.,⁴Rotherham

Dietetic Articles (Manufacturers of).

Camwal Lim., 112, Pembroke Street, N. (Waters)
 Corn Products Co. Lim., Bush House, Aldwych, W.C.2
 Fromy, Rogée & Co., Cognac (Brandy)
 Ingram & Royle Lim., Bangor Wharf, 45, Belvedere Road, S.E.1 (Waters)
 McPherson, John F. & Sons, Sallyport Buildings, Newcastle-upon-Tyne (Wines)
 Mazawattee Tea Co. Lim., Tower Hill, E.C.3
 Montgomerie & Co. Lim., Ibrox, Glasgow
 Nestlé and Anglo-Swiss Condensed Milk Co., 6 & 8, Eastcheap, E.C.3
 Portal, Dingwall & Norris, 40, Eastcheap, E.C.3 (Jamaica Rum)
 Schweitzer's Cocoa-tina (Fletcher, Fletcher & Co. Lim., Thane Rd., Holloway, N.7)
 Valentine's Meat-Juice Co., Richmond, Virginia, U.S.A.
 Vitalis Lim., 11, Springfield Upper, Clapton, E.5 (Meat Juice)

Druggists and Manufacturing Chemists.

Allen & Hanburys Lim., Bethnal Green, E.2, and 37, Lombard Street, E.C.3
 Anglo-French Drug Co. Lim., 11 & 12, Guilford Street, W.C.1
 Bayer Products Lim., 19, St. Dunstan's Hill, E.C.3
 British Colloids Lim., (The Crookes Laboratories), Park Royal, N.W.10
 British Drug Houses Lim., Graham Street, City Road, London, N.1
 British Organotherapy Co. Lim., 22, Golden Square, W.1
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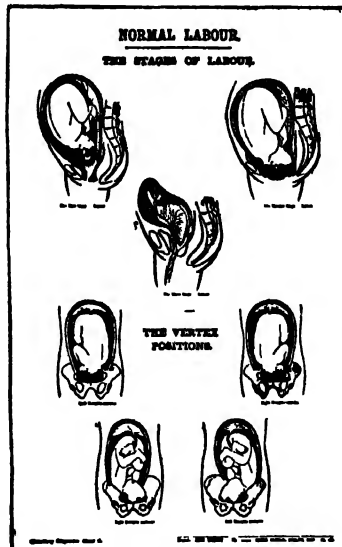
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Abstainers and General Insurance Co., Ltd., Edmund St., Birmingham. <i>Man. Director</i> , H. J. Greening. London Office, Insurance House, Kingsway, W.C.2 P	1883	43/5	58/6	84/1	3,151,989
African Life Assurance Society, Ltd., River Plate House, Finsbury Circus, E.C.2. <i>Sec.</i> , M. B. Massey-Hicks, F.I.S.A.	1904	49/-	67/3	96/7	6,029,878
Alliance Assurance Co. Ltd., Bartholomew Lane, E.C.2. <i>Gen. Man.</i> , A. Levine P	1824	49/1	65/1	90/10	22,746,500
Atlas Assurance Co. Ltd., 92, Cheapside, E.C.2. <i>Gen. Man.</i> , C. H. Falloon. <i>Act. and Life Man.</i> , William Penman P	1808	48/1	63/7	88/4	£7,903,508
Australian Mutual Provident Society, 73-76, King William St., E.C.4. <i>Man.</i> for U.K., A. W. Nicholls, A.I.A. M	1849	48/2	64/5	89/10	83,296,453
Britannic Assurance Co. Ltd., Life, Fire, Accident, and General Insurances, Broad St. Corner, Birmingham. <i>Chairman</i> , Jno A. Jefferson, F.I.A. <i>Sec.</i> , J. M. Lang, F.I.A., F.F.A. <i>Further particulars see opposite page</i> P	1866	47/9	64/-	91/1	21,000,000
British Equitable Assurance Co. Ltd., Eastern Entrance, Royal Exchange, E.C.3. <i>Man.</i> , Douglas A. Coleman P	1854	46/-	11/10	87/3	1,688,745
British General Insurance Co. Ltd., 66, Cheapside, E.C.2. <i>Man. Dir.</i> , Norman M. Walker P	1904	49/5	64/10	90/7	943,646
† British Widows' Assurance Co. Ltd., 1, Old St., E.C.1. <i>Joint Gen. Mans.</i> , Robert J. Jamieson and F. E. Crabtree P	1902	—	—	—	545,773
Caledonian Insurance Co., 19, George St., Edinburgh. <i>Gen. Man.</i> , F. J. Cameron, F.F.A., F.I.A., London (City) Office, 6, Lothbury, E.C.2 P	1805	48/5	64/6	90/7	6,827,953
Canada Life Assurance Co., 2, St. James's Square, S.W.1. <i>Man.</i> , J. R. Wandless, F.I.A. P	1847	48/5	65/4	94/2	*37,263,059
Clerical, Medical, and General Life Assurance Society, 15, St. James's Square, S.W.1, and 8, King William St., E.C.4. <i>Gen. Man.</i> , A. D. Besant P	1824	47/6	65/2	94/10	10,630,945
Colonial Mutual Life Assurance Society Ltd., 4, St. Paul's Churchyard, E.C.4. <i>Man.</i> , Ernest A. Cawdron. <i>Sec.</i> , J. S. Gillespie M	1873	48/9	65/1	89/10	13,000,000
Commercial Union Assurance Co. Ltd., 24, Cornhill, E.C.3. <i>Act.</i> , A. G. Allen, F.I.A. P	1861	46/3	63/3	93/2	19,266,715
Confederation Life Association (of Canada), Bush House, Aldwych, W.C.2. <i>Man.</i> , G. T. Varney. P	1871	48/6	65/2	94/2	18,141,832
Co-operative Insurance Society Ltd., 109, Corporation Street, Manchester. <i>Man.</i> , J. P. Jones M	1867	47/4	63/1	90/1	5,041,623
Eagle Star & British Dominions Insurance Co. Ltd., 1, Threadneedle St. E.C.2.; Life Dept., 32, Moorgate, E.C.3. <i>Man. Dir.</i> , Sir Edward M. Mountain, Bart., J.P. P	1807	48/1	63/10	89/5	15,126,363
Equitable Life Assurance Society, 19, Coleman Street, E.C.2. <i>Act. and Man.</i> , W. Palin Elderton M	1762	54/-	68/-	92/-	7,719,272
Equity & Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C. <i>Man. and Sec.</i> , A. C. Thorne, F.I.A. P	1844	48/10	64/6	90/9	9,214,530

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General Life Assurance Company General Buildings Aldwych W.C.2 Gen Man S None Miller P	1837	49/2	64/11	91/3	2,789,058
Gresham Life Assurance Society Ltd 188 100 Fleet St F.C.4 Gen Man Alex Lawson P	1849	47/6	62/10	88/6	8,418,724
Guardian Assurance Co Ltd 68 King William St and 21 Fleet Street E.C. Gen Man Geo W Reynolds Sec A G Sweet Act W A Osborne P	1821	48/10	64/6	89/3	6,420,048
Law Union and Rock Insurance Co Ltd 7 Chancery Lane W.C. Sec A H Shrewsbury P	1806	48/4	64/-	89/10	10,715,835
† Legal & General Assurance Society Ltd 10 Fleet St E.C. Gen Man W A Workman FIA P	1836	—	—	—	21,117,324
Life Association of Scotland 82 Princes St Fdin burgh Man and Act R M M Roddick Sec A G R Brown London 28 Bishopsgate E.C. Sec G S N Carter	1838	48/11	64/10	91/1	7,075,997
Liverpool and London and Globe Insurance Co Ltd 1 Dale Street Liverpool Gen Mans F J Williams and J Dyer Simpson London Office 1 Cornhill E.C.3 P	1836	49/10	65/9	91/3	10,062,690
London & Scottish Assurance Corporation Ltd King William Street House Arthur Street F.C.4 Man Frank B Cooke Sec A G H Emshie Act Harold Dougharty P	1862	48/9	64/3	91/2	4,748,157
London Assurance The 1 King William St E.C. Act and Life Man A G Paton FIA P	1720	49/-	64/8	90/2	6,676,756
London Life Association Ltd 61 King William St F.C.4 Act and Man H M Trouncker M FIA M	1806	49/3	51/-	82/	21,919,454
Marine and General Mutual Life Assurance Society 48 Fenchurch Street E.C.3 Act and Sec Howard T Cross FIA M	1852	48/10	61/-	91/6	3,474,699
Medical Sickness Annuity & Life Assurance Society Ltd 300 High Holborn W.C. Man and Sec Bertram Sutton F.C.11 M	1884	40/2	51/3	80/-	350,979
Mutual Life and Citizens Assurance Co Ltd (of Australia) Effingham Ho 1 Arundel St W.C. Man Alex S Sellar M A F F A P	1881	48/9	65/3	99/9	18,485,321
National Mutual Life Assurance Society 39 King St Cheapside E.C.2 Act and Man G H Recknell FIA F F A M	1830	48/4	63/7	89/6	5,164,992
National Mutual Life Association of Australasia Ltd 5, Cheapside F.C.2 Man H W Meyers M	1869	46/8	61/6	87/2	35,000,000
National Provident Institution 48 Gracechurch St E.C.3 Act and Sec H E Melville FIA M	1830	50/2	66/3	91/1	10,733,819
North British & Mercantile Insurance Co Ltd 61 Threadneedle St E.C.2 and 64 Princes St Edinburgh Man Dir London, Sir A Worley Bt CBE, Man, Edinburgh J E Bell P	1809	49/10	66/1	91/11	*28,512,262
Northern Assurance Co Ltd, 1 Moorgate E.C.2 Gen Man K K Peters P	1836	49/-	64/8	90/10	6,793,397
Norwich Union Life Insurance Society, Norwich Gen Man and Act, M Mackenzie Lees, F F A Sec, H G Wilton, F F A London 49 Fleet St E.C.4 Further particulars see page 12 M	1808	51/9	66/6	92/5	34,543,078
Pearl Assurance Co Ltd, 252, High Holborn, W.C.1 Man, Director J. McIntyre. P	1864	49/-	65/-	92/-	53,233,650

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Phoenix Assurance Co. Ltd. , Phoenix House, King William St., E.C., 7, St. James's Street, S.W.1, and 187, Fleet Street, E.C.4. <i>Gen. Man.</i> , R. Y. Sketch. <i>Further particulars see page xlii</i> P	1782	48/10	64/4	89/1	15,612,279
Provident Mutual Life Assurance Association , 25 to 31, Moorgate, E.C.2. <i>Man. and Act.</i> , C. R. V. Coutts, F.I.A. M	1840	48/8	64/8	90/4	8,006,000
Prudential Assurance Co. Ltd. , Holborn Bars, E.C.1. <i>Gen. Man.</i> , Sir Joseph Burn, K.B.E., F.I.A. .. P	1848	47/-	64/6	91/2	228,886,434
Refuge Assurance Co. Ltd. , Oxford Street, Manchester. <i>Man. Dir.</i> , J. Proctor Green. <i>Gen. Man.</i> , S. G. Leigh, F.I.A., London, 133, Strand, W.C. .. P	1864	49/3	65/9	91/9	47,592,247
Royal Exchange Assurance , Royal Exchange, E.C.3, and 44, Pall Mall, S.W.1. <i>Act.</i> , T. F. Anderson, F.I.A., F.F.A. P	1720	49/-	64/9	90/2	10,521,527
Royal Insurance Co. Ltd. , 1, North John St., Liverpool. <i>Gen. Mans.</i> , F. J. Williams and J. D. Simpson. <i>London Offices</i> , 24-28, Lombard St., E.C.3. <i>London Man.</i> , F. R. Bellamy P	1845	48/-	64/8	90/-	23,216,824
Royal London Mutual Insurance Society Ltd. , Finsbury Sq., E.C.2. <i>Man. Dir.</i> , Alfred Skeggs. <i>Sec.</i> , J. J. Pipe. <i>Act.</i> , J. H. Duffell, F.I.A. M	1861	46/8	63/9	91/7	24,933,413
Scottish Amicable Life Assurance Society , St. Vincent Place, Glasgow. <i>Men. and Act.</i> , R. Gordon-Smith. <i>Sec.</i> , R. Jeffrey. <i>London</i> , 17, Tokenhouse Yard, E.C.2. <i>Sec.</i> , F. K. Feuton M	1826	50/1	65/9	90/6	10,503,446
Scottish Equitable Life Assurance Society , 28, St. Andrew Square, Edinburgh. <i>Man. and Act.</i> , C. Guthrie. <i>Secs.</i> , W. R. McIlvenna, and A. C. Murray. <i>London Office</i> , 13, Cornhill, E.C.3. <i>Sec.</i> , W. S. King M	1831	50/-	65/6	90/6	9,831,386
Scottish Life Assurance Co. Ltd. , 19, St. Andrew Sq., Edinburgh. <i>Gen. Man.</i> , Lewis P. Orr, F.F.A., F.R.S.E. <i>London Office</i> , 9, King St., E.C.2. <i>Man.</i> , Jas. A. Hay P	1881	49/5	64/6	90/5	6,582,302
Scottish Provident Institution , 6, St. Andrew Square, Edinburgh. <i>Man.</i> , Sir Robert T. Boothby, K.B.E. <i>Joint Secs.</i> , A. Graham Donald and C. S. Willis. <i>Act.</i> , J. R. Armstrong. <i>London Offices</i> , 3, Lombard St., E.C.3, 52, Lime St., E.C.3, 56, Chancery Lane, W.C.2, and 17, Pall Mall, S.W.1. M	1837	36/7	51/-	75/3	23,175,599
Scottish Temperance & General Assurance Co. Ltd. , 109, St. Vincent St., Glasgow. <i>Man.</i> , Adam K. Rodger. <i>London</i> , 2, 3 & 4, Cheapside. <i>Man.</i> , C. S. McDonald. (<i>Less 10 per cent to Abstainers</i>) M	1883	48/6	63/9	89/10	6,967,795
Scottish Union & National Insurance Co. , 35, St. Andrew Square, Edinburgh. 2. <i>Gen. Man.</i> , James G. Nicoll. <i>London Office</i> , 5, Walbrook, E.C.4. <i>Sec.</i> , H. F. Kirrage P	1824	50/-	65/8	92/-	11,035,306
Scottish Widows' Fund & Life Assurance Society , 9, St. Andrew Square, Edinburgh. <i>Man. and Act.</i> , H. G. Sharp. <i>Dep. Man. and Sec.</i> , E. V. Townshend. <i>London Offices</i> , 28, Cornhill, E.C.3, and 17, Waterloo Place, S.W.1. <i>Further particulars see page lvi</i> M	1815	49/4	65/1	91/-	29,251,717
Southern Life Association , Bush House, Aldwych, W.C.2. <i>Man.</i> , Thos. Darling M	1891	46/8	61/6	87/2	5,644,467
Standard Life Assurance Co. , 3, George Street, Edinburgh. <i>Man.</i> , S. E. Macnaghten. <i>London Offices</i> , 46, Queen Victoria St., E.C., and A. B. Drayton, and 15a, Pall Mall, S.W.1. <i>Sec.</i> , E. V. Goodall M	1825	48/5	64/4	90/1	21,660,790
Sun Life Assurance Co. of Canada , 2, 3, & 4, Cockspur Street, S.W.1. <i>Gen. Man.</i> , H. O. Loesch. <i>Further particulars see opposite page</i> P	1865	48/5	65/4	94/2	121,782,271

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United Kingdom Provident Institution, 196, Strand, W.C.2. Sec., H. W. Hasler. M	1840	48/2	64/2	89/8	19,471,455
University Life Assurance Society, 25, Pall Mall, S.W.1. Act. and Sec., J. I. Gopp, F.I.A. P	1825	52/-	68/-	94/-	1,370,100
Wesleyan & General Assurance Society, Life, House Purchase, Annuities, Fire and General Business, Assurance Buildings, Steelhouse Lane, Birmingham. Man. Director, A. L. Hunt. London, Halton House, 20-23, Holborn, E.C.1. Further particulars see page 15 M	1841	49/-	65/7	91/9	10,253,615
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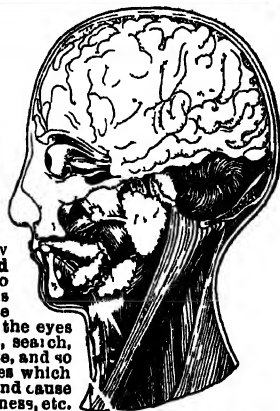
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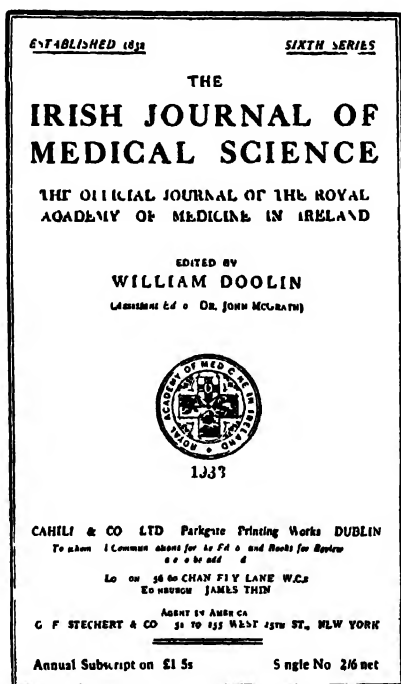
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EXCEPTIONAL SITUATION.

The situation of the Hospital and Medical School is unique, for while it is adjacent to a large poor district with a population of 500,000, it is also within a few minutes' walk of Kensington Gardens and an extensive residential district, in which students can live, and so avoid a daily wearisome journey to and from their work. Recent structural alterations include two new operating theatres and 60 additional beds.

RE-BUILDING OF THE MEDICAL SCHOOL.

The re-building of the Medical School and Institute of Pathology began in the Autumn of 1930, and is now progressing rapidly. The New Buildings will occupy a site adjacent to the Hospital, and it is hoped they will be completed and ready for occupation in the beginning of 1933.

The new School will provide departments for teaching the entire curriculum, and will include a large Library, Students' Club Room, and a Gymnasium and Swimming Bath.

SPECIAL CLINICAL FACILITIES.

The formation of Clinical Units in Medicine and Surgery has been an important advance in connection with the Clinical teaching, and this has been further developed by the affiliation for teaching purposes of several of the Hospitals in the neighbourhood, bringing up the total number of beds, available for teaching, to 1000. By special arrangement with the Lock Hospital, students attend there for courses of Venereal Diseases. By agreement with Queen Charlotte's Lying-in Hospital, all students of St. Mary's attend a short course of instruction there, without extra fee, before entering upon their duties in the Maternity District of St. Mary's.

INSTITUTE OF PATHOLOGY AND RESEARCH.

The Institute of Pathology and Research, under the directorship of Sir Almroth Wright, F.R.S., embraces seven departments, the heads of which are members of the Honorary Staff of the Hospital.

RESEARCH STUDENTSHIPS.

A considerable sum is devoted annually to research, and a part of this is applied to the upkeep of Research Scholarships, designed to enable students recently qualified to learn the technique of research work.

ENTRANCE SCHOLARSHIPS.

All Entrance Scholarships are awarded annually by nomination on the lines of the Rhodes' Scholarships.

The Geraldine Harmsworth Scholarship (£200) open to Oxford or Cambridge Students, and other University Scholarships, of the value of £200 each, are awarded annually, by nomination, to students of British or Colonial Universities who have completed their examination in Anatomy and Physiology.

APPOINTMENTS AFTER QUALIFICATION.

Numerous appointments are open to newly qualified members of the Medical School. Six House Physicians (eight months), Eight House Surgeons (eight months), and Four Resident Obstetric Officers (six months) are appointed annually. Two Resident Anaesthetists (six months), £150 per annum, Four Casualty House Surgeons (six months), £100 per annum, with board and residence. Medical Registrar and Surgical Registrar, £200 per annum, with partial board.

In addition to the above, Five Assistants to the Medical and Surgical Units are appointed from time to time, with salaries ranging from £400 to £750 per annum.

ATHLETIC GROUND.

The Athletic Ground (10 acres) is situated at North Wembley, and can be reached in 20 minutes from the Medical School. A large pavilion has been erected at a cost of £3,000.

The Illustrated Prospectus can be obtained from the School Secretary, St. Mary's Hospital, Paddington, W.2.

C. M. WILSON (M.C.), M.D., F.R.C.P., *Dean.*

THE MIDDLESEX HOSPITAL MEDICAL SCHOOL

UNIVERSITY OF LONDON

The Hospital and Medical School are fully equipped for teaching the entire medical curriculum. Students are also prepared for the Pre-Medical Examination in Chemistry, Physics, and Biology.

The West Wing of the Hospital and the Residents' Block have been rebuilt, and the Out-Patient Department has been remodelled. These, and other new buildings which are being rapidly constructed, give to the Middlesex Hospital and its Medical School, the most modern facilities obtainable in Great Britain.

HOSPITAL APPOINTMENTS

Thirty-one Resident Appointments are offered annually to students recently qualified. In addition, **Nine Registrars** are also appointed annually. Special Courses for the

Primary F.R.C.S. Examination.

There is no accommodation for Women Students.

SCHOLARSHIPS AND PRIZES

Two Entrance Scholarships, of the value of £100 each, and two University Scholarships in Anatomy and Physiology, value £90 and £60 respectively, open to Students of Universities of Oxford and Cambridge who have already passed or completed the curriculum for the professional examinations in Anatomy and Physiology, are offered for competition at the beginning of the Winter Session.

Two Broderip Scholarships, of the value of £60 and £40 respectively, are awarded every year for proficiency in Clinical Knowledge.

The Murray Gold Medal and Scholarship (£25), founded in connection with the University of Aberdeen, is awarded every third year to a Student of the Middlesex Hospital.

The following are awarded annually:—

The Hetley Prize, value £25 (Clinical Medicine, Surgery and Obstetrics).

The Lyell Medal and Scholarship, value £55 (Surgical Anatomy and Practical Surgery).

The Leopold Hudson Prize, value 11 guineas (Surgical Pathology and Bacteriology).

The Freeman Scholarship, value £30 (Obstetric Medicine and Gynaecology).

Second Year's Exhibition, value £10 10s. (Anatomy and Physiology).

New Zealand Students' Scholarship, the clinical advantages of the Hospital for one year.

Numerous Class Prizes.

The Tutors assist all Students, especially those who are preparing for examinations, without extra fee; thus the necessity of obtaining private instruction is obviated.

**Gymnasium, Common Rooms, Restaurant, Squash Rackets.
Large Athletic Ground.**

The Students' Clubs include Rugby Football, Association Football, Golf, Cricket, Hockey, Sailing, Fencing, etc., etc.

Full particulars and detailed Prospectus may be obtained on application to:—

T. IZOD BENNETT, M.D., F.R.C.P.,

Dean of the Medical School,

School Secretary, R. A. FOLEY, F.R.C.S., Middlesex Hospital, London, W.1.

ST. JOHN'S HOSPITAL

For Diseases of the Skin

• (INCORPORATED)

IN-PATIENT DEPARTMENT (40 Beds)—262, UXBRIDGE ROAD, W. 12.
OFFICES AND OUT-PATIENT DEPARTMENT—
49, LEICESTER SQUARE, W.C. 2.

OUT-PATIENT ATTENDANCES OVER 1000 A WEEK.

The OUT-PATIENT DEPARTMENT contains Laboratory, Lecture Room, Electrical Department and Medicated Vapour Baths.

The attendance of the Hon. Medical Staff is as follows:—

MONDAY	.. 2 p.m.	DR. GRIFFITH	6 p.m.	DR. DORE
TUESDAY	.. 2 p.m.	DR. GOLDSMITH	6 p.m.	DR. WIGLEY
WEDNESDAY	.. 2 p.m.	DR. DOWLING	6 p.m.	DR. MACLEOD
THURSDAY	.. 2 p.m.	DR. SIBLEY	6 p.m.	DR. GOLDSMITH
FRIDAY	.. 2 p.m.	DR. ROXBURGH	6 p.m.	DR. DOWLING
SATURDAY	.. 2 p.m.	MEDICAL REGISTRAR		

The Hospital is the recognized centre in London for Post-Graduate Study of Diseases of the Skin. Teaching is carried out under the auspices of the

LONDON SCHOOL OF DERMATOLOGY.

Chairman: DR. J. M. H. MACLEOD.

Staff of Lecturers:—

H. W. BARBER, M.B., F.R.C.P.	..	Guy's Hospital
H. T. BARRON, M.D., M.R.C.P.	..	Westminster Hospital
S. ERNEST DORE, M.D., F.R.C.P.	..	St. Thomas's, Westminster, and St. John's Hospitals
G. B. DOWLING, M.D., M.R.C.P.	..	West London & St. John's Hospitals
J. A. DRAKE, M.D., F.R.C.P.	..	King's College Hospital
W. N. GOLDSMITH, M.A., M.D.(Camb.), M.R.C.P (Lond)	..	University College and St. John's Hospitals
A. M. H. GRAY, C.B.E., M.D., F.R.C.P., F.R.C.S.	..	University College Hospital
W. GRIFFITH, M.B., M.R.C.P.	..	St. John's Hospital
H. D. HALDIN-DAVIS, M.B., M.R.C.P., F.R.C.S.	..	Royal Free Hospital
E. GRAHAM LITTLE, M.D., F.R.C.P.	..	St. Mary's Hospital
H. MACCORMAC, C.B.E., M.D., F.R.C.P.	..	Middlesex Hospital
J. M. H. MACLEOD, M.D., F.R.C.P.	..	Charing Cross & St. John's Hospitals
W. J. O'DONOVAN, O.B.E., M.D., M.R.C.P.	..	London Hospital [Hospitals]
A. C. ROXBURGH, M.D., F.R.C.P.	..	St. Bartholomew's and St. John's
H. C. G. SEMON, M.D., M.R.C.P.	..	Royal Northern Hospital
W. KNOWSLEY SIBLEY, M.D., M.R.C.P.	..	St. John's Hospital
M. SYDNEY THOMSON, M.D., M.R.C.P.	..	King's College Hospital
A. WHITFIELD, M.D., F.R.C.P.	..	King's College Hospital (Consulting Physician)
J. E. M. WIGLEY, M.B., M.R.C.P.	..	Charing Cross & St. John's Hospitals

Lectures and Demonstrations are given regularly during the Winter and Summer Sessions. Instruction is given daily in the Out-Patient Department as above. Special classes or individual teaching can be arranged in the Pathological Department. For fees and further particulars apply to the Dean or Secretary.

LEONARD G. R. TURPIN, F.C.C.S., Secretary.

J. E. M. WIGLEY, M.B., Dean.

COUNTY OF LONDON.

THE MAUDSLEY HOSPITAL**DENMARK HILL, S.E.5.****Medical Supt. - EDWARD MAPOTHER, M.D., F.R.C.P., F.R.C.S.**

THIS HOSPITAL, organized by the London County Council on the lines of the combined Neurological and Psychiatric Clinics of the Continent and America, represents the first provision of its kind by a public body in this country. Its objects are:—

- (a) Research into the pathology and treatment of Nervous and Mental Disorders;
- (b) Instruction of Medical Students, and advanced post-graduate courses in Psychological Medicine;
- (c) Facilities for diagnosis of difficult cases;
- (d) **TREATMENT** of all forms of Nervous Disorders (both organic and functional), including early and recoverable forms of mental disturbance.

Admission as in-patients for psychoses is limited to cases of good prognosis, except in very special cases for diagnosis or of particular value for research or teaching.

Approval by the Medical Superintendent is an indispensable preliminary.

Treatment is entirely on a voluntary basis. Every in-patient is required to sign an application form for admission, and is entitled to leave within 24 hours of notifying desire to do so. Restriction of liberty while in Hospital is reduced to a minimum.

The special features of treatment at this Hospital for mental disturbances include (1) Complete absence of association with the certified insane and of the stigma connected with this; (2) Careful separation, from admission, of the quiet from restless cases; (3) A Medical Staff sufficiently numerous for modern individual psycho-therapy; (4) All means of physical treatment; (5) The services of eminent specialists in various branches of medicine and surgery; (6) The co-operation of a Pathological Department under Dr. F. L. GOLLA, ensuring application of the most modern methods; (7) A very numerous, highly educated, and experienced nursing staff, almost entirely women.

OUT-PATIENTS are seen at 2 p.m. (Men on Mondays and Thursdays, Women and Children on Tuesdays and Fridays). All types of nervous and mental disorder are eligible for treatment in this Department.

IN-PATIENTS: Accommodation includes—

- (a) 194 Beds in wards and separate rooms of the Maudsley Hospital itself.
- (b) 35 Beds in wards and separate rooms in an Annexe at King's College Hospital.
- (c) 13 Private rooms (for Ladies) in the Maudsley Hospital, with special sitting rooms, garden, and dietary.

TERMS:

- (a and b) £5 a week, but in case of patients with a legal settlement in the County of London a less sum may be charged according to means.
- (c) £6 6s. a week.

All communications should be addressed to the *Medical Superintendent*.
MONTAGU H. COX,
Clerk of the London County Council.

FOUNDED 1866	HOSPITAL	INCORPORATED 1900
BEDS 88	FOR EPILEPSY AND PARALYSIS	<i>Special Departments :</i> Massage and Electrical Treatment X-Ray Pathological Ear, Nose and Throat Dental Ophthalmic Psychological Psychiatric 20 Private Wards 6 Pay Beds
Free and Paying Patients received in both In- and Out-Patient De- partments. The latter is open every week-day except Saturday, at 2 p.m.	and other diseases of the Nervous System	H. W. BURLEIGH <i>Secretary</i>
SUPPORTED BY VOLUNTARY CONTRIBUTIONS	MAIDA VALE LONDON	

GORDON HOSPITAL FOR RECTAL DISEASES

VAUXHALL BRIDGE ROAD, LONDON, S.W.1.

FOUNDED 1884.

Chairman—H. SCOTT DENNINGTON, Esq.

Bankers—Messrs. Hoare & Co., 37, Fleet Street.

34 BEDS.

HONORARY MEDICAL STAFF.

Consulting Surgeons.—Edgar Hughes, Esq., F.R.C.S.; P. Maynard Heath, Esq., M.S., F.R.C.S.
Surgeons.—C. J. Ogle, Esq., M.R.C.S.; W. Ernest Miles, Esq., F.R.C.S.; Peter L. Daniel, Esq., F.R.C.S.; A. Lawrence Abel, Esq., M.S., F.R.C.S.

Assistant Surgeon.—Eric Crook, Esq., F.R.C.S.

Anæsthetists.—F. J. Lawson, Esq., M.B.; Howard Jones, Esq., M.B.; F. de Caux, Esq., M.B.

Resident Medical Staff.—One House Surgeon.

Matron.—Miss Ida Symonds.

Operations Tuesdays, Wednesdays, and Thursdays. The practice of the Hospital is free to Medical Men and Students. Out-patients seen on Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays at 2 p.m. *Tuesdays at 6 p.m.* All treatment is free. In-patients pay according to their means for maintenance. **PRIVATE WARDS.**

A chief feature of the Hospital is to provide for sufferers whose means are unequal to the cost of private treatment, and who yet are not fit subjects for a Free Hospital.

Lt.-Col. CLEMENT COBBOLD, M.A., *Secretary.*

TAUNTON SCHOOL, Taunton

A PUBLIC SCHOOL FOR BOYS

Boys are regularly prepared for the First M.B. Examination, University Scholarships in Chemistry, Biology, etc.

Special facilities are offered for the teaching of Chemistry, Physics, Botany, and Zoology.

The Science Buildings contain seven laboratories, two lecture rooms, science library, store rooms, etc.

PHOSPHORUS from HEAD MASTER.

Central London Throat, Nose, and Ear Hospital

GRAY'S INN ROAD, LONDON, W.C.1

(Close to King's Cross Stations).

OUT-PATIENT CLINICS are held daily, during which special attention is given to the instruction of Post-Graduate Students.

CLINICAL ASSISTANTSHIPS are tenable for periods of three, six or twelve months, and Clinical Assistants are expected to attend at least two clinics a week, when a table is reserved for them in the Out-Patient Department for the examination of patients. These appointments afford the best method of obtaining a satisfactory knowledge of the Speciality.

Arrangements can always be made to suit the individual requirements of those in general practice who may be unable to attend regularly.

WEEKLY LECTURES by members of Hon. Medical Staff—Fridays, 4 p.m.

COURSES IN METHODS OF EXAMINATION AND DIAGNOSIS are given at frequent intervals.

SPECIAL INTENSIVE COURSES OF LECTURES AND DEMONSTRATIONS are given twice yearly, in May and October, in conjunction with the fellowship of Medicine. This course includes Operative Surgery, Anatomy and Physiology, Peroral Endoscopy, and Pathology and Bacteriology Classes, and is especially suitable for Students intending to take the Diploma in Laryngology and Otology of the Conjoint Examining Board (D.L.O., R.C.P. & S. Eng.). A full syllabus of the routine work and of the Intensive Courses may be obtained from the Dean or the Secretary-Supt.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL

(UNIVERSITY OF LONDON)

DENMARK HILL, LONDON, S.E.5.

KING'S COLLEGE HOSPITAL is one of the best equipped Hospitals in England, and serves a population of nearly two millions.

THE HALL OF RESIDENCE is near to the School.

THE ATHLETIC GROUND is within 10 minutes' walk of the Hospital.

FOURTEEN ENTRANCE SCHOLARSHIPS, total value of £1,530, are awarded annually. DENTAL SCHOOL. A full Dental Course is given at King's Coll. Hospital and King's College.

The Calendar, Details of Scholarships, etc., will be sent on application to the DEAN, J. A. DRAKE, M.D., F.R.C.P., D.P.H.; or to the Secretary, S. C. RANNER, M.A. (Cantab.), King's College Hospital Medical School, Denmark Hill, London, S.E.5.

QUEEN MARY'S HOSPITAL FOR THE EAST END

(Founded 1861; Incorporated by Royal Charter, 1917).

STRATFORD, LONDON, E.15

Patron: HER MAJESTY THE QUEEN.

President: HIS ROYAL HIGHNESS THE DUKE OF GLOUCESTER, K.G.

Deputy President: Sir LEONARD LYLE, Bt., J.P. Chairman: T. MAY-SMITH, Esq.

Secretary: MAJOR RAPHAEL JACKSON.

THE POOREST OF THE POOR are treated at this Hospital. Normal Accommodation, 216 Beds. Cost of Endowing a Bed, £1000; a Cot, £500. Funds most urgently needed to meet current expenditure, and will be gratefully received by W. A. VERNON, Esq., Hon. Treasurer, Hawkwell Place, Pembury, Kent, or by the Secretary.

In-Patients treated, 1931	.. 3,264	Out-Patient Attendances, 1931	.. 150,369
Accidents treated, 1931	.. 20,899	Ordinary Expenditure, 1931	247,714/10/2
Income from Annual Subscriptions and Invested Property		..	£4,840/8/2

RAPHAEL JACKSON (Major), Secretary.

ROYAL NORTHERN GROUP OF HOSPITALS

6,153 In-Patients, and 339,579 Out-Patient Attendances Annually.

Royal Northern Hospital, Holloway, N.7 - - - **286 Beds**

Recognised by the Examining Board of the Royal College of Physicians and Surgeons as a place of study during the Fifth Year of the Medical Curriculum. Twenty-one Special Departments are maintained. Re-equipped Light and X ray Departments. Maternity Department, Contributory Wards, General Wards, St. David's Wing with 66 beds for private patients, in private rooms, with separate Operating Theatres for the Wing, private Sitting Rooms and Sun Rooms

Royal Chest Hospital, City Road, E.C. - - - **85 Beds**

For treatment of all Diseases of the Heart and Chest (Cases of Tuberculosis are admitted for diagnosis only)

Grovelands Hospital (Recovery), Southgate - - - **60 Beds**

For reception of patients from above Hospitals.

Reckitt Convalescent Home, Clacton-on-Sea - - - **35 Beds**

**Maternity Nursing Association, Myddelton Square, E.C.1,
and 235 Camden Road, N.7.** - - - **466 Beds**

For District Midwifery work with Ante-Natal and Infant Welfare Clinics

FUNDS ARE URGENTLY NEEDED.

Post Graduate Instruction

Special Courses are held twice yearly in Medical and Surgical and special subjects, and are open to all medical practitioners free of charge. The Lectures are advertised beforehand in the Medical Journals.

Special Courses in Anæsthetics

3 Months—3 Guineas; 6 Months—4 Guineas.

Clinical Assistantships are available in all departments of the Hospital. Clinical Clerkships and Pathological Clerkships for a period of 3 months are available. Fees—2 Guineas.

School for Radiographers

Courses lasting 1 year commence ½ yearly for the training of Radiographers. Fees—25 Guineas.

Further particulars may be obtained from

Gilbert G. Panter, Secretary, Royal Northern Hospital, Holloway, N.7.

ROYAL DENTAL HOSPITAL OF LONDON

**SCHOOL OF DENTAL SURGERY (University of London),
Leicester Square, LONDON, W.O.2.**

Students are admitted for the curriculum for the B.D.S. Degree and the L.D.S. Diploma.

Dental Mechanics.—Pupils may join at the commencement of either the October or May Sessions for the training in Dental Mechanics specified in the Curriculum.

Hospital Practice.—The School is thoroughly equipped. The CLINIC of the Hospital is UNRIVALLED.

For further particulars apply to The Dean.

LONDON FEVER HOSPITAL

FOUNDED 1802.

ISLINGTON, N.1.

The only Hospital of its kind in or around London which is NOT RATE SUPPORTED.

DISEASES TREATED are SCARLET FEVER, DIPHTHERIA, MEASLES and GERMAN MEASLES in the GENERAL WARDS, these and other INFECTIOUS DISEASES in PRIVATE ROOMS.

General Ward Fees—Children, 2 guineas; Adults, 3 guineas per week.

Private Rooms—7 and 10 guineas per week.

AMBULANCE sent 'on receipt of Telephone message (CLERKENWELL 9786).

Secretary - W. ELLIOT DIXON.

UNIVERSITY OF BRISTOL.

FACULTY OF MEDICINE.

THE University affords complete courses of instruction for its own examinations, those of the University of London and those of the Conjoint Board etc, for Medical Degrees or Diplomas, save the D P H. The Dental Department affords the necessary instruction for the Degrees and Diploma of the University and of other examining bodies in that subject

The University confers the following Degrees and Diplomas:

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY	M B Ch B
MASTER OF SURGERY	Ch M
DOCTOR OF MEDICINE	M D
DOCTOR OF PHILOSOPHY	Ph D
BACHELOR OF DENTAL SURGERY	I D S
MASTER OF DENTAL SURGERY	M D S
DIPLOMA IN DENTAL SURGERY	I D S
DIPLOMA IN PUBLIC HEALTH	D P H

The early part of the curriculum so interlocks with the curriculum for the B Sc that the Medical student may without much loss of time take also the degree of B Sc. The whole of the Dental Mechanical work for the Bristol Royal Infirmary and the Bristol General Hospital is done in the University laboratory by the students, instructed by skilled mechanics.

CLINICAL WORK is done at the Bristol Royal Infirmary and the Bristol General Hospital, which together contain 668 beds. The Bristol Royal Hospital for Sick Children and Women (100 beds) the Bristol Eye Hospital, the Bristol City and County Asylum the Bristol City Lever Hospital and, by the kind permission of the Health Committee of the Bristol City Council Southmead Infirmary are also open for the clinical instruction of students.

SCHOLARSHIPS.—There are Henry Herbert Wills Science Scholarships, and a Miriam Badock Entrance Scholarship, available to boys from Clifton College, which may be held in the Faculty of Medicine. Students from the City of Bristol may, on their merits receive financial aid from the City Scholarship Fund on application to the Director of Education Guildhall, Bristol. Forms of application must be returned to him by April 10th.

Several Scholarships and Prizes are open to students during their Hospital career.

HOSPITAL APPOINTMENTS open to students after qualification —

At the Bristol Royal Infirmary—Four House Surgeons one Casualty House Surgeon, two House Physicians, one House Physician for Cancer Research Wards, one Resident Obstetric Officer one Ophthalmic and Gynaecological House Surgeon, one Ear, Nose and Throat House Surgeon, one Assistant to the Senior Resident Medical Officer who also acts as House Surgeon, and House Surgeon to the Skin Department, and one Dental House Surgeon.

At the Bristol General Hospital—Senior Resident Medical Officer; one Casualty House Surgeon, two House Physicians, two House Surgeons; one Resident Obstetric Officer, one House Surgeon for Special Departments; one Dental House Surgeon. All these appointments are salaried, with board and residence.

For further particulars and prospectus apply to the **DEAN** of the Faculty of Medicine.

ROTUNDA HOSPITAL DUBLIN.

UPWARDS of 2,000 maternity cases and 1,000 gynaecological intern patients are treated in the Hospital during the year. Besides the Hospital there is an extern Maternity Department with over 2,000 cases. The routine for Students consists of attendance at the Morning Lectures on Midwifery and Gynaecology, examination of patients in the Gynaecological Department, attendance at operations and all abnormal labour in the Hospital Wards, and conduction of labour cases in the intern and extern departments.

In addition there is a large Antenatal Clinic and an Infants' Department where students are encouraged to attend. The Pathological Laboratory is open to the Class, and the X-Ray plant adds greatly to the Hospital.

Qualified Students are given facilities for following and observing all abnormal cases in the hospital or district, and are allowed, so far as possible, to assist at gynaecological operations.

The Hospital Courses are always going on during the year, and Students can join at any time. The class is limited, therefore it is advisable to register in advance. Board and lodging can be obtained in the Hospital, where the living quarters are extremely comfortable.

Extra classes in gynaecological diagnosis and operative midwifery are conducted by the Assistants to the Master.

FEES: One month, £6 6s.; months other than the first, £4 4s. Three months, £12 12s. L.M. Course, £21.

The L.M. Certificate is given to fully qualified Practitioners of Medicine on examination after six months' attendance at the Hospital.

FULL PARTICULARS FROM—

BETHEL SOLOMONS, M.D., F.R.C.P.I., MASTER, ROTUNDA HOSPITAL.

University of St. Andrews (SCOTLAND).

Chancellor—The Rt. Hon. STANLEY BALDWIN, M.P., P.C., LL.D.

Rector—General the Rt. Hon. J. C. SMUTS, P.C., C.H., K.C., F.R.S.

Vice-Chancellor and Principal—Sir JAMES COLQUHOUN IRVINE, C.B.E., D.Sc., LL.D., Sc.D., D.C.L., F.R.S.

FACULTY OF MEDICINE

(Dean—F. J. CHARTERIS, M.D.)

The University confers the following DEGREES AND DIPLOMAS—M.B., Ch.B., M.D., Ch.M., Ph.D., D.P.H., L.D.S., D.P.D. (all open to men or women).

SESSION 1932-1933 opened 7th October, 1932. The whole curriculum may be taken at Dundee, or the first two years may be taken in St. Andrews, the remaining three in Dundee.

CLINICAL INSTRUCTION at Dundee Royal Infirmary, and other Medical and Surgical Institutions in Dundee.

BURSARY (Scholarship) Competitions. June annually. Entries due 8th May.

RESIDENTIAL ENTRANCE SCHOLARSHIPS FOR MEN. Five or six of £100 competed for in June. Medical Students are eligible.

FEES for complete M.B., Ch.B. Course, exclusive of Examination Fees, Hospital Fees, etc., £182. Fees for L.D.S., £88 10s.; Fee for D.P.D., £25.

PRELIMINARY EXAMINATION. September and March. Entries due 8th August and 7th February.

RESIDENCE HALLS for Men and Women at St. Andrews; for Women at Dundee. Provision made for POST-GRADUATE STUDY AND RESEARCH.

Full information may be obtained from the SECRETARY OF THE UNIVERSITY, 71 North Street, St. Andrews; or, the DEAN OF THE FACULTY OF MEDICINE, Westlands, St. Andrews.

.. THE .. UNIVERSITY OF LIVERPOOL FACULTY OF MEDICINE.

The University grants degrees in Medicine, Surgery, Hygiene, Orthopaedic Surgery, Dental Surgery, and Veterinary Science, also degree of Doctor of Philosophy, and Diplomas in Public Health, Tropical Medicine, Tropical Hygiene, Veterinary Hygiene, Medical Radiology and Electrolgy, and a Licence in Dental Surgery. Students may also prepare in the University for the examinations of other licensing bodies.

Medical School Buildings.—The buildings of the Medical School are all modern, and contain spacious lecture rooms, and well-equipped laboratories and class-rooms for the study of all the more important subjects which form the basis of medicine. In addition, laboratories are provided for medical research in Biochemistry, Tropical Medicine, Physiology, Comparative Pathology, Pathology, Bacteriology, Hygiene, and Cytology.

Hospitals.—The Clinical School consists of four general hospitals—the Royal Infirmary, the David Lewis Northern Hospital, the Royal Southern Hospital, and the Stanley Hospital; and of five special hospitals: the Eye and Ear Infirmary, the Liverpool and Samaritan Hospital for Women, the Royal Liverpool Children's Hospital, St. Paul's Eye Hospital, and Liverpool Maternity Hospital. These hospitals contain in all a total of over 1500 beds.

Fellowships and Scholarships.—Fellowships, Scholarships, and prizes of over £1000 are awarded annually. There are also numerous Entrance Scholarships. Particulars may be obtained on application.

The following Prospectuses may be obtained on application to the Registrar:—Medical Faculty, School of Tropical Medicine, School of Dental Surgery, School of Veterinary Science, and Diploma in Public Health.

WALTER J. DILLING, M.B., Ch.B.

SCHOOL OF MEDICINE OF The Royal Colleges, EDINBURGH. (FOUNDED 1505.)

SUMMER SESSION, 1933, opens 18th APRIL.

WINTER SESSION, 1933-34, opens 3rd OCTOBER.

THE Lectures qualify for the English and Scottish Universities and other Medical Examining Boards.

One half of the Qualifying Classes required by any individual student for graduation in the University of Edinburgh may be attended in this School.

The School offers a choice of Teachers upon the various subjects comprised in the Medical Curriculum.

The Calendar of the School, giving all necessary information regarding Classes, Fees, and Examinations, will be published on September 15th; a copy may be obtained (price 9d. post free) on application to the—

DEAN OF THE SCHOOL, SURGEONS' HALL, EDINBURGH.

PLAISTOW HOSPITAL, LONDON, E.13.

INSTRUCTION IN FEVERS, etc.

This Hospital is fully equipped for instruction in infectious diseases. It is recognized by the Universities of London, Cambridge, and Oxford, the Royal Colleges of Physicians and Surgeons, etc.

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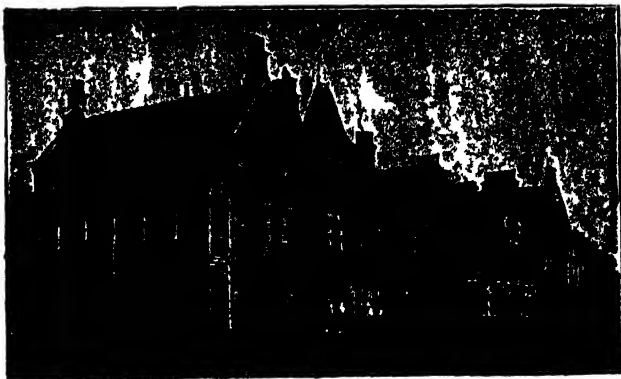
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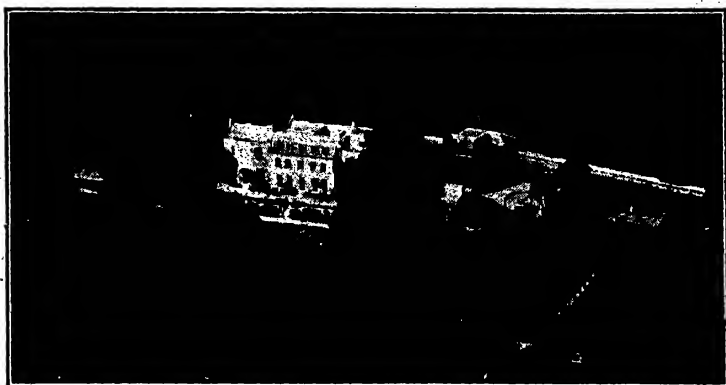
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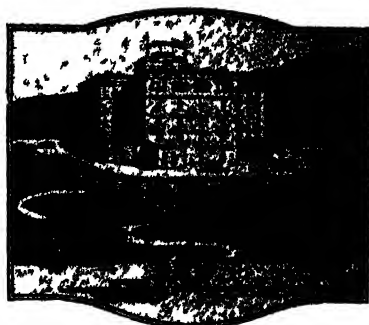
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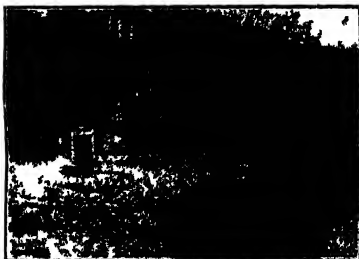
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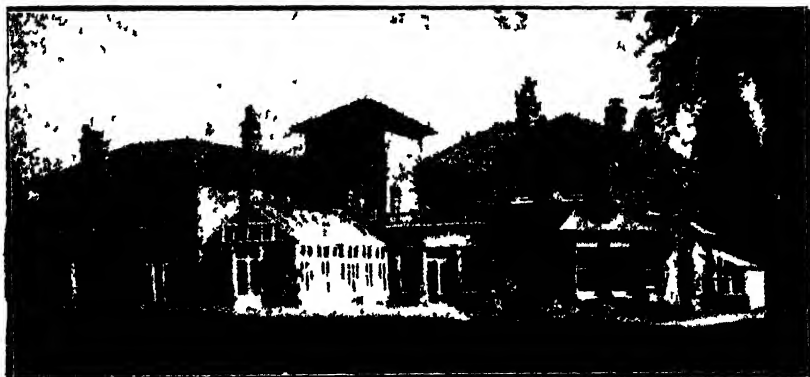
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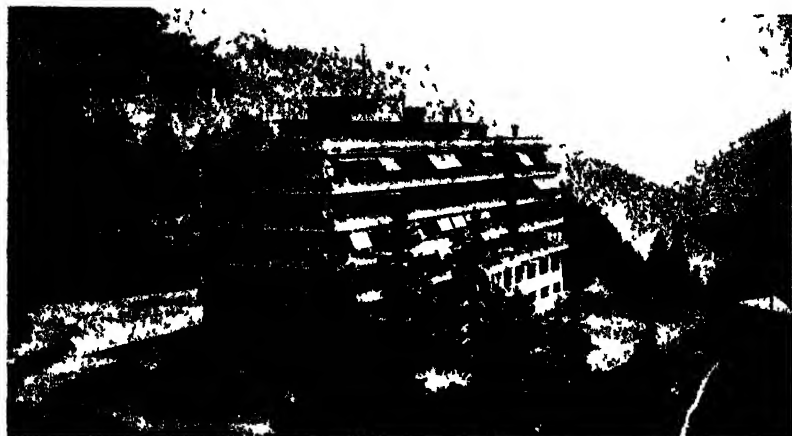
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* Leonard Hill, "Sunshine and Open Air."

† Leysin Meteorological Bureau.

‡ Maurer and Billwiller, "Das Klima der Schweiz"



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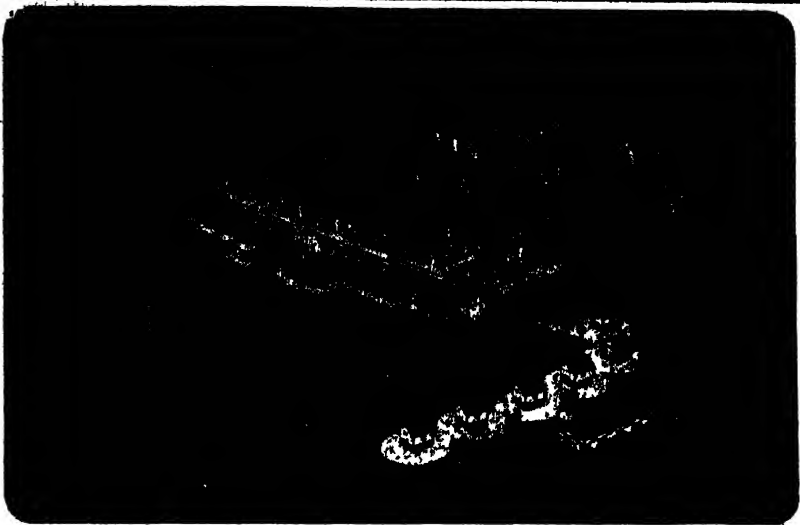
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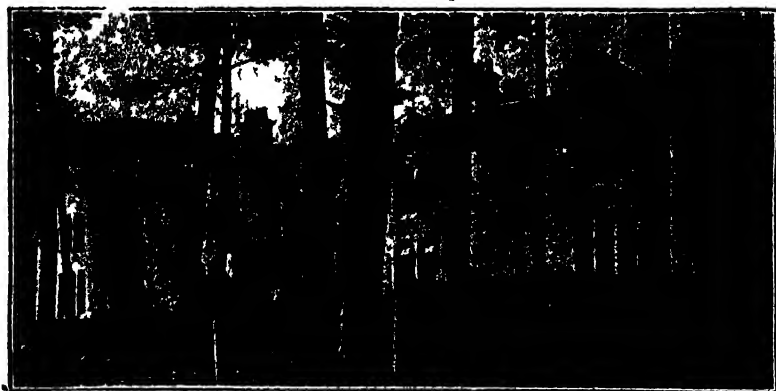
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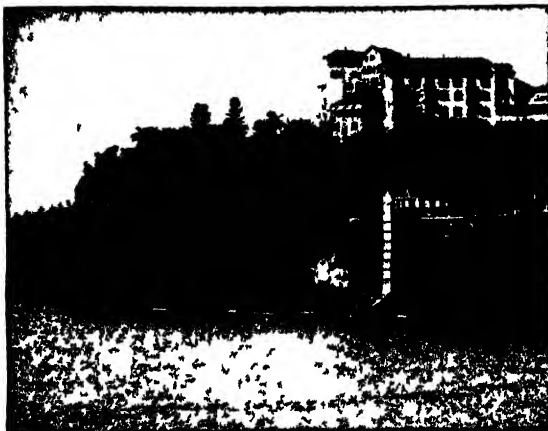
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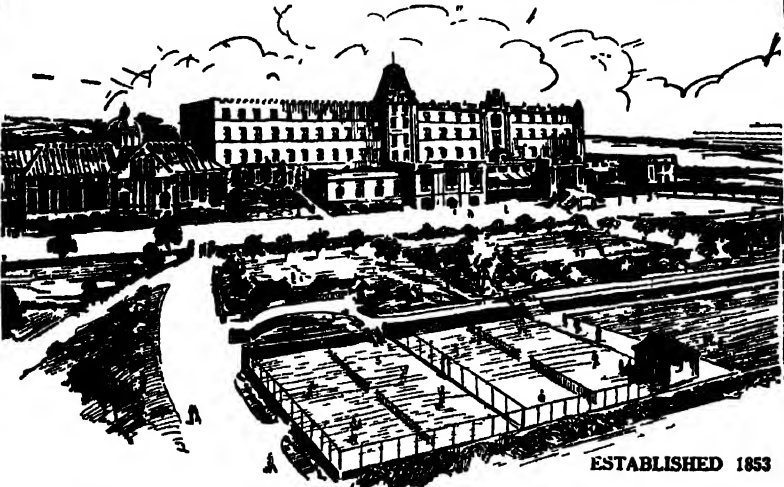
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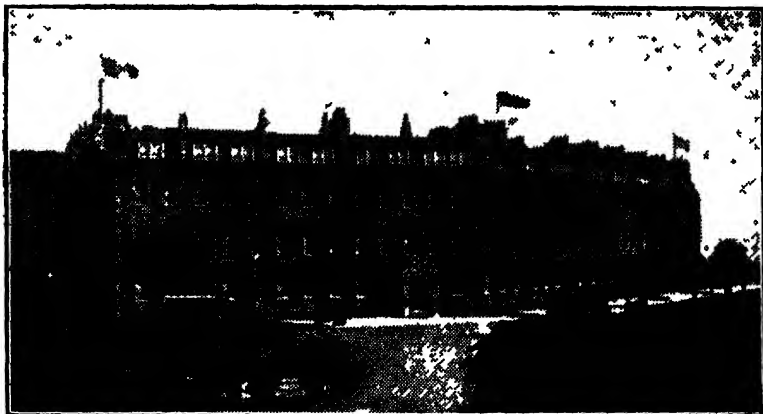
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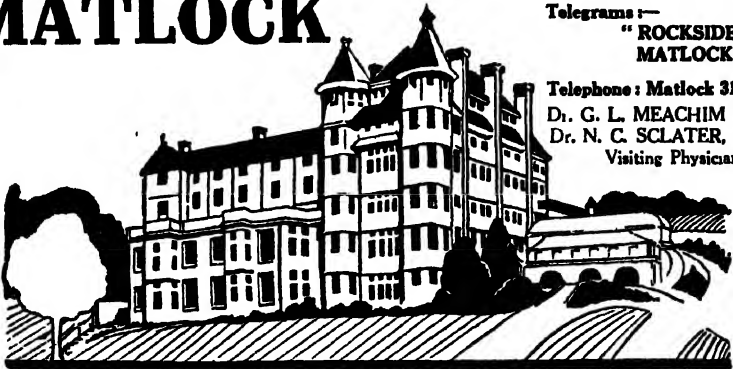
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**A Registered Hospital for the Care & Treatment of
both Sexes of the Upper and Middle Classes, when
suffering from Nervous and Mental Disorders. . .**

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THIS HOSPITAL is pleasantly situated on Headington Hill, on the outskirts of the City of Oxford. The grounds, which extend to over 120 acres, command extensive views of the surrounding country.

The buildings are arranged, so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

TEMPORARY PATIENTS. VOLUNTARY PATIENTS ARE RECEIVED.

For Terms and further particulars, apply to the—

Telephone—

Physician Superintendent, ALEX. W. NEILL, M.D. 2083 OXFORD.

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CHEADLE, CHESHIRE.

**A Registered Hospital for MENTAL DISEASES,
and its Seaside Branch, GLAN-Y-DON, Colwyn Bay, N. Wales.**

THE object of this Hospital is to provide the most efficient means for the treatment and care of those of the Upper and Middle Classes suffering from MENTAL and NERVOUS DISEASES. The Hospital is governed by a Committee appointed by the Trustees of the Manchester Royal Infirmary.

VOLUNTARY, TEMPORARY and CERTIFIED PATIENTS RECEIVED.

For Terms and further information apply to the MEDICAL SUPERINTENDENT.

Telephone - Gatley 2231.

Littleton Hall, Brentwood

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A limited number of Ladies received, with or without certificate.
Large grounds. 18 miles from London. 1 mile from station.
Full particulars from DR. HAYNES. *Telephone: Brentwood 45.*

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*A Registered Hospital for the
Treatment of MENTAL DISORDERS
of the EDUCATED CLASSES.*

THIS Institution is situated in a beautiful and healthy locality within easy reach of London. It is fitted with every comfort. Patients can have Private Rooms and Special Attendants, as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Patients can be admitted.

There is a BRANCH ESTABLISHMENT at CANFORD CLIFFS, BOURNEMOUTH, where Patients can be sent for a change and provided with all the comforts of a well-appointed home.

*For Terms, apply to the RESIDENT MEDICAL SUPERINTENDENT,
St. Ann's Heath, Virginia Water, SURREY.*

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THIS ESTABLISHMENT, which was founded by the late W. H. O. SANKEY, M.D., F.R.C.P., for the reception of a limited number of

LADIES & GENTLEMEN MENTALLY AFFLICTED,

— is now conducted by his son, —
E. H. O. SANKEY, M.A., M.B., B.C. Cantab.

The Ladies' Division is directly supervised by MRS. MILLER.

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Carriages, horses, motor, lawn-tennis, golf, and fishing are provided.

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Letters and Telegrams should be addressed to—

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BOX (Near BATH).

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OF THE BRAIN AND NERVOUS SYSTEM**

THIS House is situate 450 feet above sea level, and commands extensive views of the surrounding country.

Special accommodation for Patients of the Voluntary Class, which is encouraged.

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Consulting Physician:
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NORWICH.

Telephone: Norwich 80.
Telegrams: "Small, 80 Norwich."

Private Home for the cure and treatment of a limited number of Ladies and Gentlemen suffering from Nervous and Mental Illness.

About two and a half hours from London by express train, L N E R, and in connection with the Midlands by Midland and Great Northern Joint Line

The mansion, surrounded by 14 acres of well-wooded grounds, is furnished as a private residence, and nothing suggests confinement, the safety of patients being ensured by a large staff of experienced nurses. Any modern therapeutic measures can be undertaken in suitable cases. Private Suites of Rooms with special nursing available

Seaside quarters are available when desired, and all amusements conducive to recovery are provided

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Voluntary patients, temporary patients, and patients under certificates are admitted for treatment

FEEES from 4 guineas a week upwards according to requirements. Vacancies occasionally exist at reduced rates for ladies and gentlemen on the recommendation of the patient's own physician

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PRIVATE HOME for MENTALLY AFFLICTED LADIES.

Ten only received.

Apply, Medical Officer or Mrs. PEELE.

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NEWTON-LE-WILLOWS, LANCASHIRE

Telegraphic Address: "STREET, ASHTON-IN-MAKERFIELD" (two words only)
Telephone: ASHTON-IN-MAKERFIELD 11

A PRIVATE MENTAL HOSPITAL FOR THE TREATMENT OF NERVOUS & MENTAL DISORDERS EITHER TEMPORARILY, VOLUNTARILY OR UNDER CERTIFICATE

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Consultations can be arranged by appointment.

Resident Medical Licensee..... } **J. C. WOOTTON, L.R.C.P.Lond., M.R.C.S.Eng.**
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 mentally afflicted

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Portsmouth City Mental Hospital

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MENTAL DISORDERS

Telephone :
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Telegraphic Address: STONE HOUSE, DARTFORD, KENT.

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Extensive grounds. Detached Villas Chapel. Garden
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PRIVATE HOSPITALS for MENTAL AND NERVOUS ILLNESS, including the ALLIED DISORDERS OF ALCOHOLISM and THE DRUG HABIT

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 THE EARL OF DARTMOUTH.

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Special Attention is given to the Curative Treatment of Early Cases, also to Fresh Air Treatment & Occupational Therapy.

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'Phone 10 P.O. Church Stretton.

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WITHIN two miles of the G.W.R. and L.M. & S. Railway Stations at Gloucester, the Hospital is easily accessible by Rail from London and all parts of the United Kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of over 280 acres. Voluntary Patients of both sexes are also received for Treatment.

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Resident Superintendent.
Telephone: No. 7 BARNWOOD.

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Special suites for suitable patients, in new annex, consisting of private sitting room, bed room, attendant's room (if necessary) and private bath room and lavatory.

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Both Certified Temporary and Voluntary Patients received.

The House, with grounds of 10 acres, is situated 1200 ft above sea level, and commands extensive views of the surrounding country.

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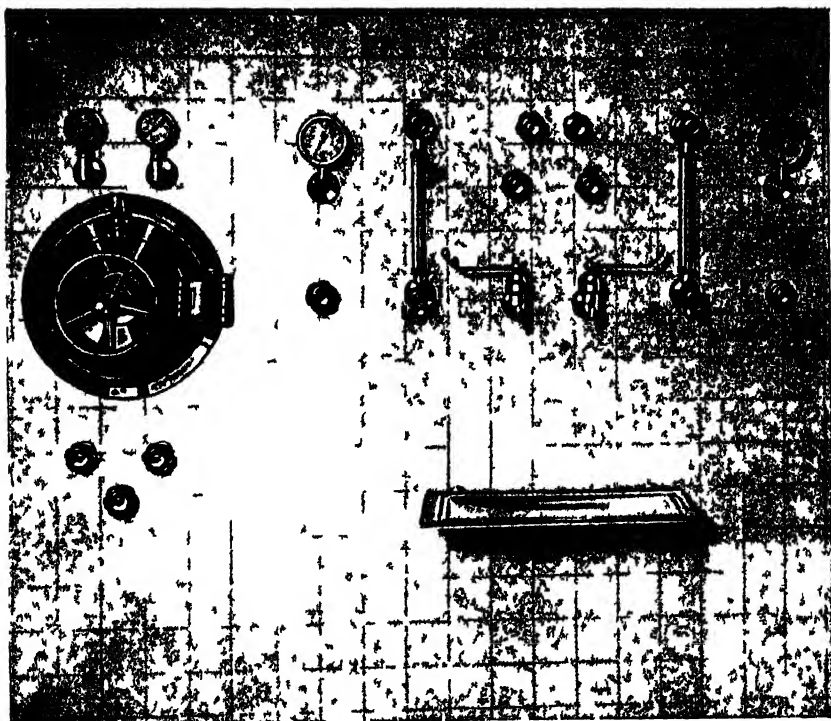
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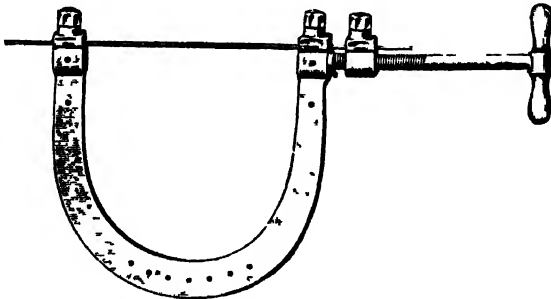
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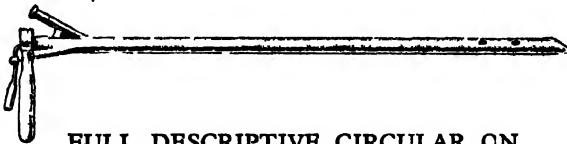
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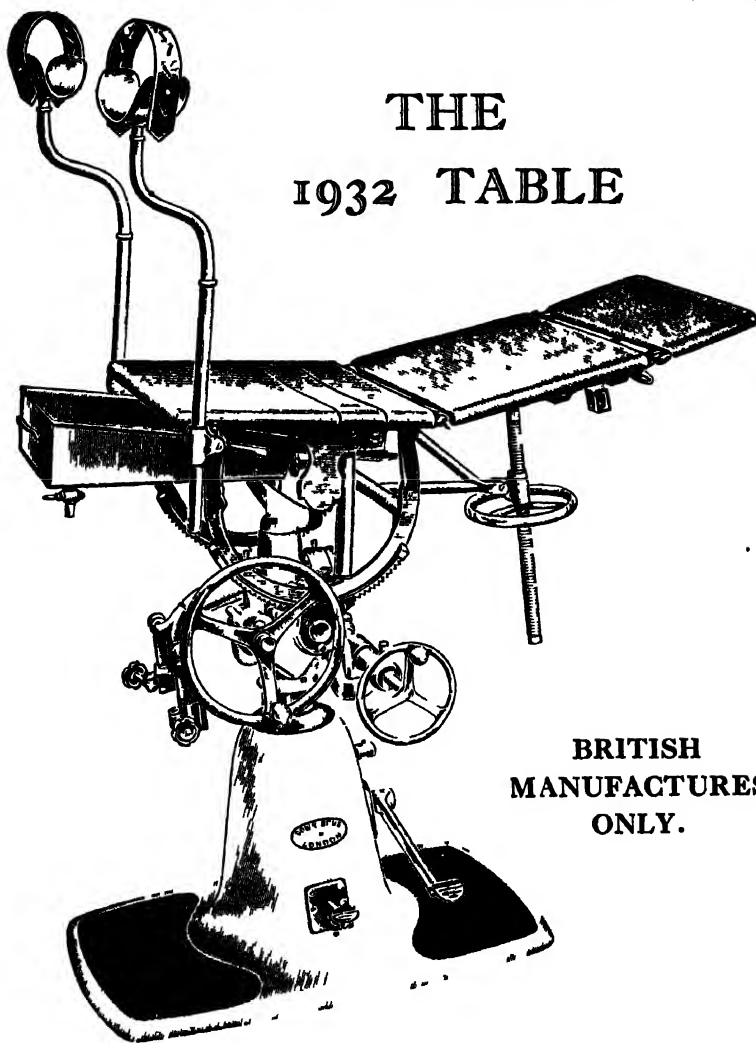
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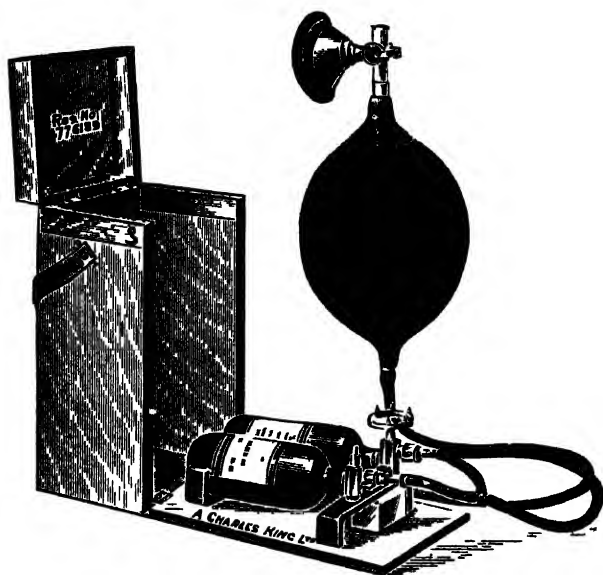
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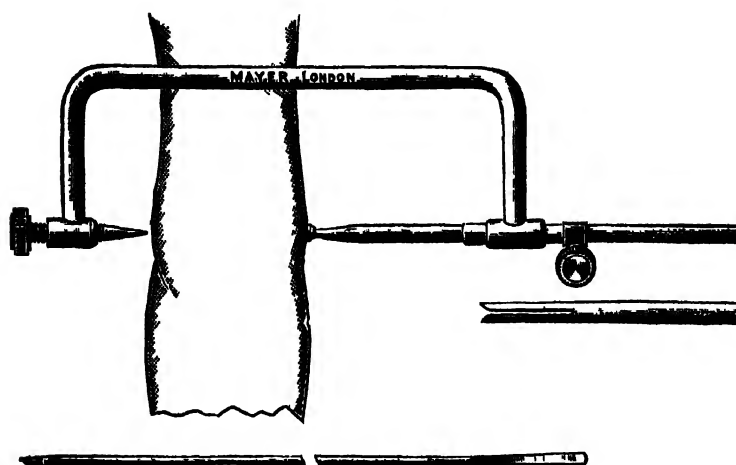
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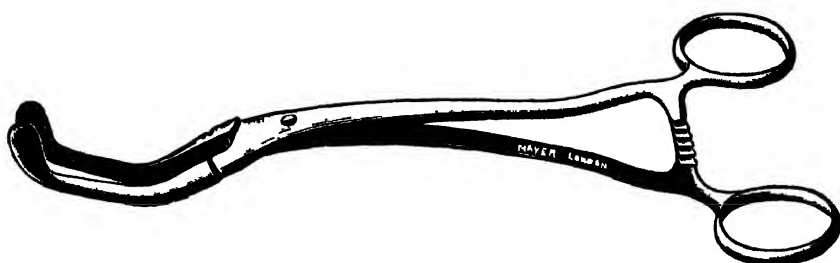
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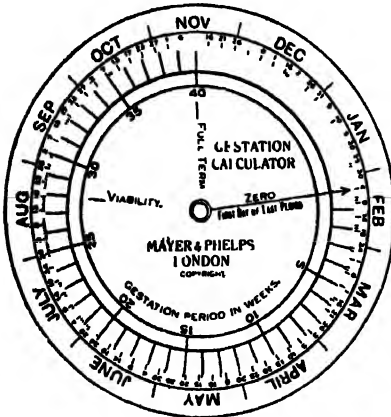
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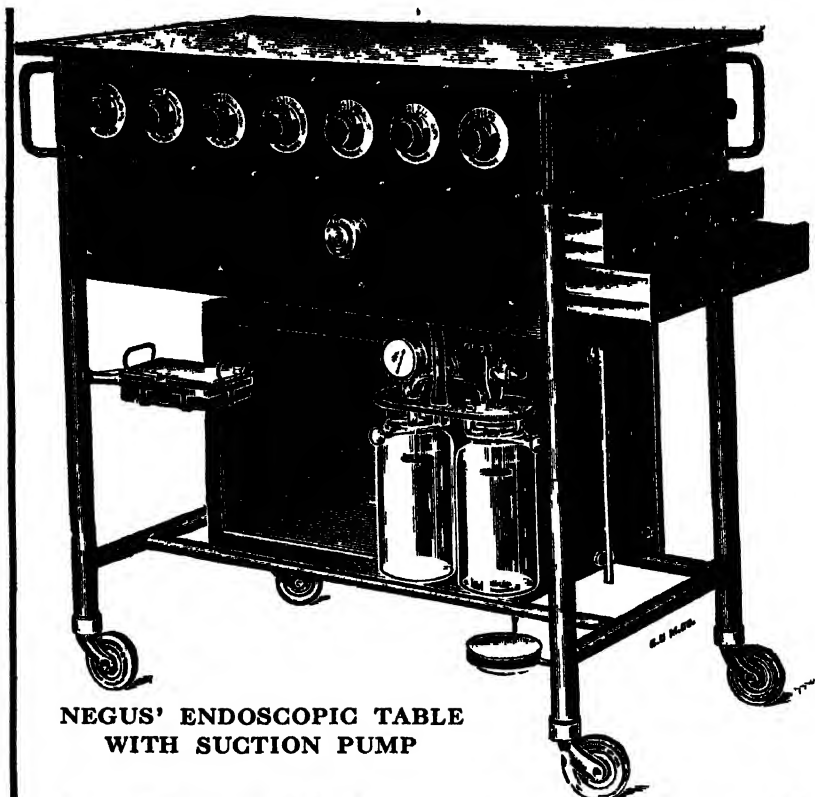
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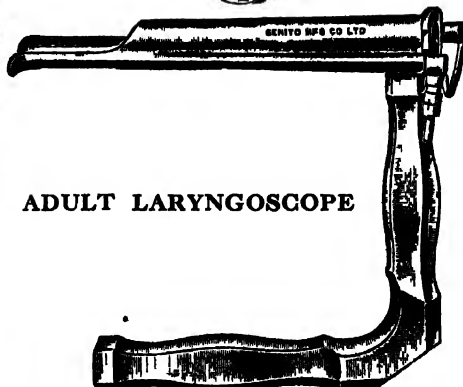
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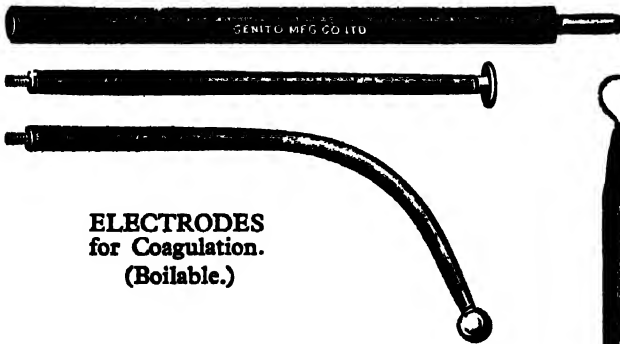
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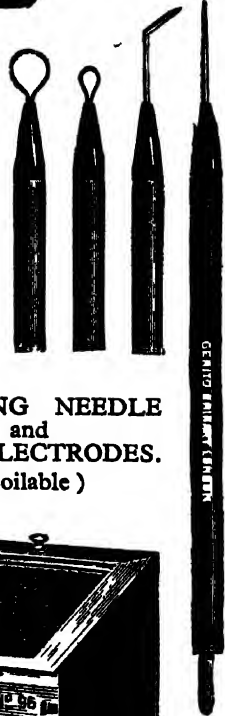
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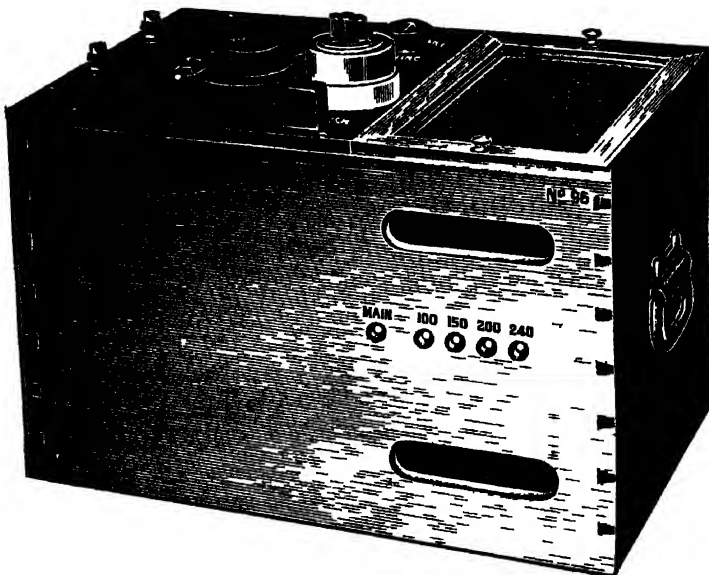
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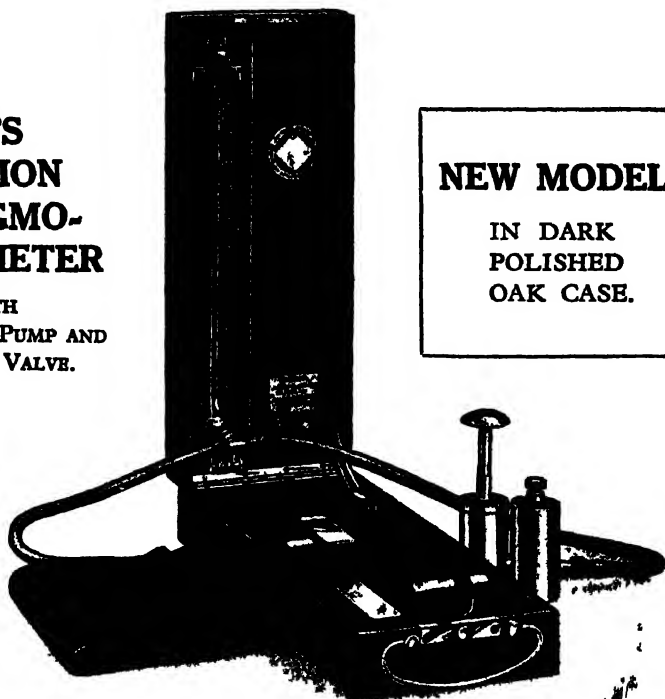
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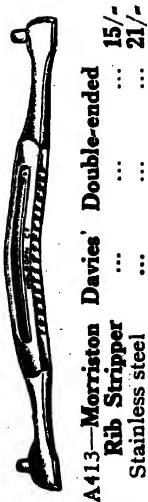
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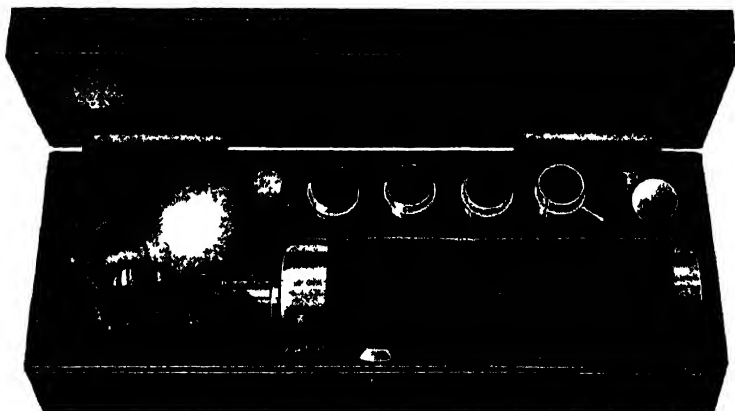
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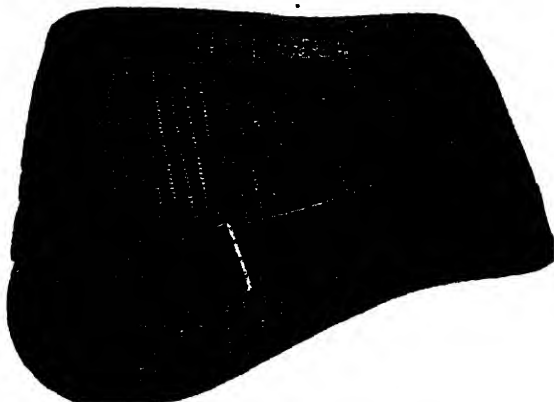
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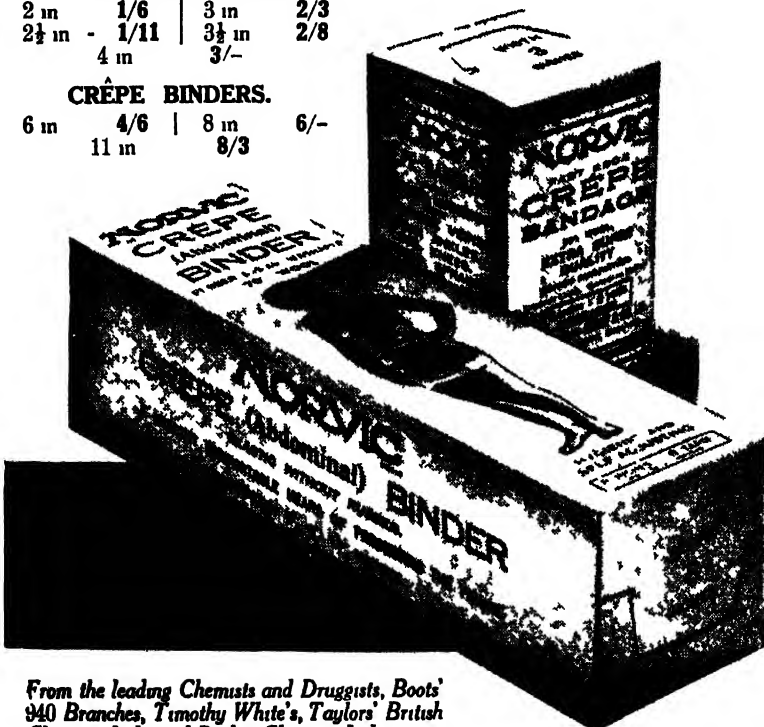
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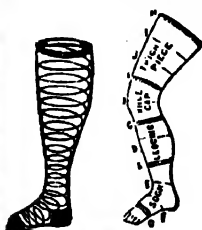
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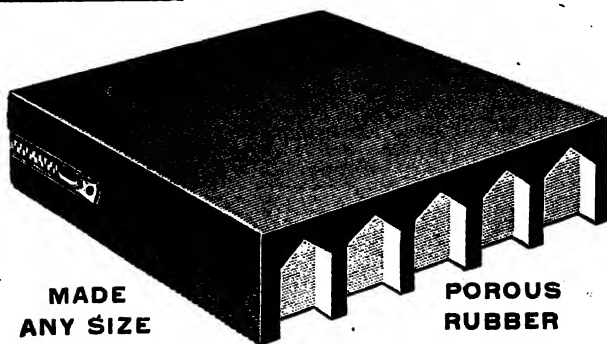
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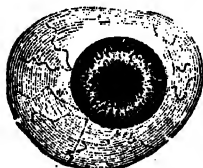
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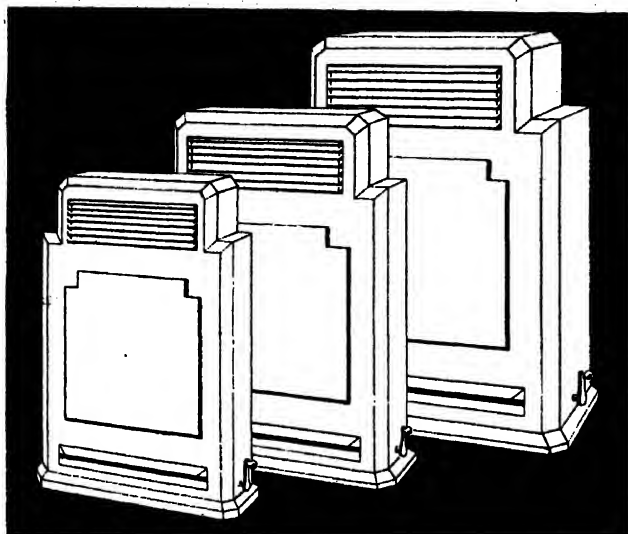
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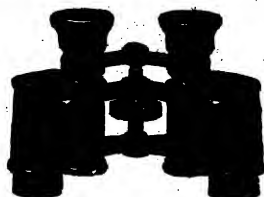


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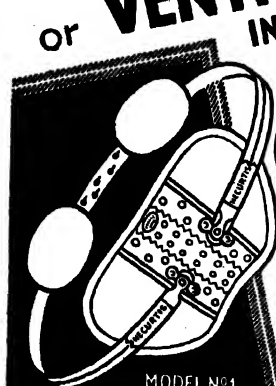
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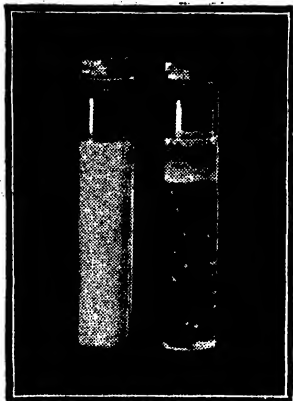
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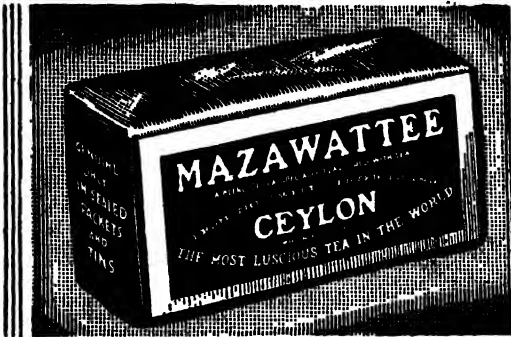
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